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**Changes in performance on the nursing licensure examination:  
An investigation of possible causes**

**Webster, Sadie Brown, Ed.D.**

**The University of North Carolina at Greensboro, 1991**

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CHANGES IN PERFORMANCE ON THE NURSING LICENSURE  
EXAMINATION: AN INVESTIGATION OF  
POSSIBLE CAUSES

by

Sadie Brown Webster

A Dissertation Submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

Greensboro  
1991

Approved by



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Dissertation Adviser

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The purpose of this study was to identify possible factors that might relate to the changes in the performance on the NCLEX-RN. Data were examined on sixty-two graduates in one baccalaureate nursing program at a predominately black, moderate size state university. Questions answered by the study were: (1) Were there initial differences in the characteristics, at the time of their admission to the nursing major, between the students enrolled during the 1981-1984 and those enrolled during the 1984-1987 periods?; (2) Were there differences in the nursing program offered between the 1981-1984 period and the 1984-1987 period?; (3) Were there differences in the students' perceptions of the nursing program of those enrolled during the 1981-1984 period and those enrolled during the 1984-1987 period?

Data were collected from the graduates' records and from a questionnaire. The data were analyzed by using the t-test, frequency distribution, and content analysis. The following variables were investigated: SAT-V, prenursing GPA, reading level, completion of general studies requirement, SAT-M, age, marital status, prior educational experience, need to repeat nursing courses and perceptions of individual situations of the nursing program.

Based on the analysis of the data, the following major findings were identified:

1. Traditional academic variables (SAT-V score, reading level, and prenursing GPA) and traditionally demographic variables (age, marital status, prior educational experience, and the need to repeat nursing courses) did not significantly differentiate successful performance, on the NCLEX-RN, during the first period (1981-1984) and unsuccessful performance during the second period (1984-1987).
2. Students who complete general studies requirements prior to admission to the nursing major tend to be more successful, in terms of performance on the NCLEX-RN, than those who do not.
3. The SAT-M mean score of graduates in both periods who passed the NCLEX-RN tended to be significantly higher than those of graduates who did not pass.
4. The employment of more full-time faculty and more doctoral prepared faculty along with several program changes did not appear to have a positive impact on the performance of graduates who did not pass the licensure examination.



APPROVAL PAGE

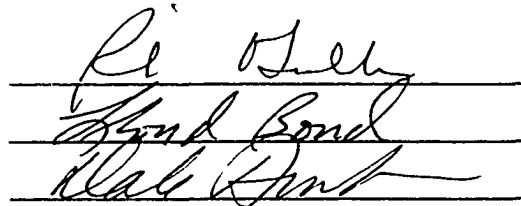
This dissertation has been approved by the following committee of the faculty of the Graduate School at the University of North Carolina at Greensboro.

Dissertation

Advisor



Committee Members



September 13, 1991

Date of Acceptance by Committee

September 13, 1991

Date of Final Oral Examination

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## CHAPTER I

### INTRODUCTION

Graduates of two consecutive three-year periods of a predominately black, moderate size state university's (Winston-Salem State University) nursing program produced different performance on the nursing licensure examination. During the first time period (1981 fall semester through 1984 spring semester), graduates had a perfect pass record on the initial writing of the examination. However, this successful pattern changed for the second time period (1984 fall semester through 1987 spring semester) when some graduates were unsuccessful on the licensure examination. This outcome presented potential problems relative to the nursing program's future certification status and its continuation. The general purpose of this study was to investigate several explanations for the change in the graduates' performance on the licensure examination. One specific purpose of the study was to determine whether the students enrolled during the period of 1981-1984 and the students enrolled during the period of 1984-1987 differed in initial ability at the time they began the nursing major.

A second purpose was to ascertain whether there were differences in the nursing program offered during the two time periods. Several variables relative to program change during

the three consecutive years of 100 percent pass rate on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) were compared to the three subsequent years when unsuccessful performance began emanating. A third purpose of this study was to determine whether there were differences in the perceptions of the programs as experienced by graduates enrolled during the periods from 1981-1984 and those graduates who were enrolled from 1984-1987.

#### Background of the Problem

In recent years, there have been increasing demands on institutions of higher education to devise and implement strategies to better prepare their graduates. Some of these demands resulted from political, social, and economic pressures. Employers, consumers, and the general public have been pressuring higher education to reform its educational programs so that an increasing number of graduates can be more responsible and competent in their chosen careers.

In response to the need to improve the quality of baccalaureate nursing education, nursing educators have proposed frequent and systematic program evaluations. Felts (1986) felt that an assessment of nursing programs is important for many diverse reasons. These include "financial exigency in higher education in both the public and private sector, the rights of students as consumers, the role of liberal arts in professional curricula, career mobility, and the change in role of the health care providers" (p.372).



Although assessment has become a central issue, the nursing profession is also facing other problems. There is continuous debate within the profession concerning the entry level for professional nursing, the declining enrollment in nursing education, the shortage of nurses, the increasing demand for nurses with baccalaureate level preparation, and the quality of the nursing curricula.

Several factors affect the resolution of curriculum concerns in nursing. However, one of the critical foci is related to the new graduates who are unable to immediately practice nursing because of their lack of success to become licensed. A recent report on the decline in the overall pass rate on the nursing licensure examination in North Carolina (Tar Hill Nurse, 1988) indicated a decline in the pass rate among the 1987 graduates from all three levels of nursing: baccalaureate degree, associate degree, and diploma programs. The overall pass rate on the NCLEX-RN for the 1987 graduates from North Carolina dropped to a low of 86 percent over the five-year period from 1983 to 1987. The greatest decline in the pass rate within this five-year period was from 1986 to 1987. In 1986, the pass rate for all three types of nursing program graduates in North Carolina was 92 percent. However, the change in the pass rate of baccalaureate nursing program graduates declined from 88 percent in 1986 to 81 percent in 1987 (Tar Hill, January-February, 1988).

In 1977, the nursing program at Winston-Salem State University (WSSU) was one of three nursing programs within the University of North Carolina system to receive a mandate from the Board of Governors to strengthen its program. According to the mandate, program improvement was largely measured by the successful performance of the graduates on their first writing of the licensure examination. A minimal percentage of graduates passing the examination over a three-year period was required under the mandate. By 1981, two-thirds of the graduates were expected to successfully pass the examination on the first writing, and a three-fourths pass rate by 1983.

Prior to the mandate, the dean and faculty of the WSSU nursing program recognized the existing problem of the low pass rate on the examination. The need to increase the percentage of graduates who passed the examination was actively addressed by initiating plans to improve the quality of the program. Therefore, a major program revision implemented at the beginning of the 1979 academic year specified that to be accepted as a nursing major, students were required to meet these minimum admission standards: a cumulative grade point average (GPA) of 2.6 on a 4.0 scale for the first two years of college; a Scholastic Aptitude Test (SAT) verbal score of 390; an eleventh grade reading level; and the completion of the prerequisite general education courses. Successful progression in the program required that students maintain a minimum grade of "C" in all nursing

courses. However, students could repeat the course in which they earned their first "D". A second grade less than a "C" resulted in dismissal from the program.

Another program change separated the curriculum into an upper and lower division. Students completed the general education courses during their first two years before applying to the nursing major. The upper division included the last two years when the professional nursing courses were taken. Other changes included revising course syllabi and course content, upgrading course examinations with better test items, and adopting a variety of teaching aids. A new director and additional faculty members were also recruited. Supplementary financial resources were obtained from foundations and from the federal government to strengthen the program. These funds were used for activities such as establishing a Learning Resources Center, purchasing new books and equipment, and obtaining other educational resources.

Following the implementation of program changes, remarkable results occurred in the graduates' performance on the licensure examination. Graduates were highly successful in passing the NCLEX-RN on their initial writing. The nursing program surpassed the minimal percentage that was set by the Board of Governors. The pass rate for the 28 graduates during three consecutive years, 1981 to 1984, was 100 percent.

After these three years of excellent results, six graduates were unsuccessful in passing the examination on

their initial writing during the 1984 to 1987 period. This decline in the pass rate resulted in a move toward a previous pattern of unsuccessful performance which was close to being below the minimum set by the N.C. Board of Nursing, and which created much concern for the nursing program and the university. Such unsuccessful performance could pose serious problems for the program. This becomes crucial when one considers the potential consequences relating to the established standards of the nursing program's accrediting agencies, and the North Carolina Board of Governors. Realizing the possible impact if there were another decline in the pass rate, the Chancellor sought explanations for the decline. Therefore, this study emerged in large part from the need to determine what program changes, if any, were related to graduates' performance on the NCLEX-RN.

Nursing programs must satisfactorily meet the standards established by the Boards of Nursing to maintain their approved status. Among other standards, the North Carolina Board of Nursing considers an educational program to be in compliance with its requirements when the program's graduates obtain a minimal pass rate of 75 percent each year of their first writing (North Carolina Board of Nursing, 1988). As with any nursing program having small numbers of generic nursing graduates each year, it takes unsuccessful performance of only a few on the NCLEX-RN to be a potential threat for lowering the pass rate to an unacceptable level. In such

cases, program evaluation becomes increasingly important for identifying strengths and weaknesses of nursing education programs.

#### Statement of the Problem

The problem in this study was to determine whether there were differences in the performance on the NCLEX- RN of graduates from two time periods (1981-1984 and 1984-1987) that could be attributed to any of three types of factors. These factors included: (1) differences in nursing students' characteristics upon entry into the nursing major during the two time periods, (2) differences in the nursing program that existed during the two time periods and (3) differences in the perceptions of the nursing program as experienced by graduates who were enrolled during the 1981-1984 period compared to those graduates who were enrolled during the 1984-1987 period.

#### Purpose of the Study

The major purpose of this study was to determine which, if any, of several elements of the nursing programs at WSSU were related to student performance on the licensure examination during the two, three-year periods of 1981-1984 and 1984-1987. One primary purpose was to investigate whether there was a difference in the characteristics of students enrolled in the three consecutive years of perfect performance on the NCLEX-RN and those of students enrolled during the three subsequent years, when unsuccessful performance emerged. A second purpose was to determine whether there were

differences in the nursing programs during the two time periods to account for the performance on the NCLEX-RN. A third purpose was to explore whether the perceptions of the nursing programs as experienced by graduates enrolled in the three consecutive years of perfect performance on the NCLEX-RN differed from those graduates who were enrolled in the three subsequent years when unsuccessful performance emerged.

#### Significance of the Study

Study of the impact of program changes on nursing graduates' performance on the NCLEX-RN is limited. Few previous studies appear to have identified variables associated with dramatic improvement in the quality of nursing programs after major revisions. Findings from the current study may have relevance for nursing programs that face similar poor performance of graduates on the NCLEX-RN. In addition, the evaluation of program changes and their relationship to the success rate of graduates on the NCLEX-RN will add to the literature on evaluation research.

Results from this study may also provide useful information for determining a successful nursing student's profile and for recruiting students who might have the greatest potential for succeeding in the nursing program. The findings may be beneficial to nursing educators by identifying weaknesses of nursing majors that may interfere with the student's success in the nursing program and which may result in subsequent failure on the licensure examination. In

addition, the information might be useful for guiding the student to remediation resources in preparation for the examination. This study will serve to provide a substantive data base for decisions involving various aspects of the nursing curriculum. In response to the National League for Nursing (NLN) accreditation requirement, it will also serve as the basis for an ongoing evaluation of the nursing program at WSSU.

#### Research Questions

These research questions emerged from the study's purposes:

1. Were there initial differences in the characteristics at the time of their admission to the nursing major between the students enrolled during the 1981-1984 and those enrolled during the 1984-1987 periods?
2. Were there differences in the nursing program offered between the 1981-1984 and the 1984-1987 periods?
3. Were there differences in the perceptions of the nursing programs as experienced by students enrolled in the nursing major during the 1981-1984 period and those enrolled during the 1984-1987 period?

The research questions were examined to determine if they could be used to explain the differences in the performance on the licensure examination between two groups of WSSU's nursing graduates. Data were studied to see whether there was a difference in the abilities of the two groups of students

at the time of their entrance into the nursing major that may account for their difference in performance on the NCLEX-RN. To examine the abilities at the time of entrance, admission requirements to the nursing major and demographic factors were investigated. These included the following: (a) admission requirements - SAT verbal score, reading level, prenursing cumulative grade point average, and prerequisite general education courses: (b) demographic factors - age, marital status, previous college experience and need to repeat nursing courses.

Secondly, program changes related to the following variables were examined to determine whether there were differences in the nursing program between the two periods. These variables included: (a) faculty credentials and employment status, faculty turnover, faculty/student ratio; (b) course revisions relative to additions and/or deletions as well as sequencing; and (c) budget allocations.

The third research question investigated data to determine whether there were differences between graduates' perceptions of the programs. Graduates' perceptions of their experiences in the nursing program were determined by use of a questionnaire. Collected data were summarized to show how the two groups performed relative to characteristics upon entrance to the nursing major and their program experience. Frequency distributions of data were developed to compare graduates of the two time periods (1981-1984 and 1984-1987).



### Limitations

This study is limited to a small sample that is convenient and special. Due to the small size and its limited potential statistical power, there must be dramatic differences to identify which changes account for outcome differences between the two groups. Another consideration which limits this study is the inclusion of only one nursing program. These conditions caution generalizations only to similar nursing programs with similar student populations. Other variables, e.g. self-concept, motivation and test anxiety that are not included in this study might have some influence on WSSU nursing graduates' performance on the examination and might constitute other limitations of this study.

### Organization of the Study

The first chapter is an introduction to the study and includes a statement of the problem, the purposes of the study, background information, research questions, limitations and definition of terms. Chapter II provides a review of related literature. Issues concerning the curriculum in higher education and nursing education also appear in that chapter. The methodology and procedures are discussed in Chapter III. Chapter IV presents an analysis and interpretation of data. The summary, which includes conclusions and a proposal for the implementation of recommendations, comprises Chapter V.

### Definition of Terms

The following definitions were used in this study:

1. **Generic student**-refers to a student who is preparing for the first degree in professional nursing.
2. **State Board Test Pool Examination (SBTPE)**-refers to the older version of the nursing licensure examination to become certified as a registered nurse. This examination was given by each state to qualified candidates to determine their competency to provide minimum safe nursing care. Certification as a registered nurse is mandatory in order to practice nursing. The SBTPE was divided into five sections which included each major discipline in the nursing profession. Each discipline required a minimal score for a successful pass rate to become a registered nurse.
3. **National Council Licensure Examination for Registered Nurses (NCLEX-RN)** - refers to the current licensure examination to be certified as a registered nurse. This comprehensive examination replaced the SBTPE in 1982 and requires one composite score to indicate a pass or fail performance of the candidate.
4. **Successful performance on the NCLEX-RN**- a passing score of 1600 set by the National Council of State Boards of Nursing on the nursing licensure examination on the initial attempt.

5. Lower division of the nursing program - the first two years of general education and nursing support courses included in the nursing curriculum (freshman and sophomore years).
6. Upper division of the nursing program - the last two years of professional nursing courses included in the nursing curriculum (junior and senior years).
7. Grade Point Average (GPA) - the prenursing cumulative grade point average based on the first two years of general education and nursing support courses. The GPA was one of the admission criteria required for progression to the nursing major.
8. Reading Level - refers to the score obtained on the Nelson Denny Reading Test. A minimum reading level was established as one of the admission criteria required for progression to the nursing major.
9. General Studies Requirement - refers to core courses in general education at the freshman and sophomore levels which are required of all students at the university.

## CHAPTER II

### REVIEW OF LITERATURE

Nursing leaders continue their efforts to upgrade the nursing profession. The profession is seriously considering requiring the baccalaureate degree as a prerequisite to entry into the nursing profession. This is problematic, since it also is recognized that concurrently enrolled 4 year nursing students need to improve their academic performance. Consequently, this study investigated several variables to determine possible factors associated with changes in the performance on the NCLEX-RN at one baccalaureate granting institution during two time periods (1981-1984 and 1984-1987). More specifically, the purpose of this study was to examine (1) initial characteristics of graduates prior to their admission to the nursing program during these two time periods; (2) program changes during the two time periods; and (3) graduates' perceptions of the nursing program during the two time periods.

This chapter focused on relevant literature to provide a background and perspective for the study. The presentation of the literature is divided into three major areas: (1) the professional nursing licensure examination, (2) nursing education in baccalaureate programs, and (3) factors related

to the success on the licensure examination and/or academic performance.

#### Professional Nursing Licensure Examination

Currently there are three different programs of study that educate nurses who take the same licensure examination following their graduation. Successful passage of this examination entitles the graduate to become a registered nurse (RN), thus sanctioning their legal entry into the practice of nursing. The licensure examination tests competencies needed for performing safely and effectively as a newly licensed nurse.

The three nursing programs prepare graduates to provide health care to a diverse population. However, differences exist in the focus and emphases of the programs. Academic preparation is oriented for graduates of each program to assume the various roles and responsibilities to meet today's significant changes expected of the registered nurse. The diploma or hospital based program requires three years of study and leads to a certificate or diploma; the associate degree program requires two years of study, is located in a technical or community college, and leads to an associate degree in nursing; and the baccalaureate program awards the bachelor's degree after four years of study where at least the major professional nursing courses are taken in a four-year college or university setting.

Nursing graduates must meet the mandatory requirement of becoming licensed in order to practice nursing. Such certification initially began in the latter 1800's when each state devised its own laws and practices to govern the safe practice of nursing for the public (Matassarini-Jacobs, 1989). In 1944, governance of the licensure examination began spreading nationwide under the auspices of the National League for Nursing (NLN). At that time the NLN developed the examination which was known as the State Board Test Pool Examination (SBTPE). In 1952, all states required nursing graduates to take the examination. Control of the examination shifted again in 1955 to the American Nurses Association (ANA), however, NLN continued to administer the test. By 1978, another change took place whereby NLN was granted full control over the development and administration of the examination.

The SBTPE consisted of five subtest areas which represented the five major disciplines in nursing: medical nursing, surgical nursing, obstetric nursing, pediatric nursing, and psychiatric nursing. This examination was scored by the norm-referenced approach which indicates that the standard was set based on group performance. Successful passage of the examination required obtaining a minimal score of 350 on each subtest.

Nursing leaders in later years voiced concern over the use of the norm-referenced format as well as other aspects

of the licensure examination. An acknowledged concern about the norm-referenced scoring was that:

All candidates scoring above 1.5 standard deviations below the mean passed regardless of where that point fell in relation to actual nursing competencies measured by test content. This resulted in a fairly constant percentage (84-86 %) of candidates passing (the) NCLEX, but not at (a) consistent standard of competence in terms of what the successful candidate could do upon entering nursing practice (Issues, 1988, p. 3).

In 1982, the National Council of State Boards of Nursing revised the SBTPE and implemented a new examination. The new test was referred to as the National Council for Licensure Examination for Registered Nurses (NCLEX-RN) and was administered in July 1982. This revised examination is a comprehensive test that integrates the practice of nursing rather than uses the format of prior specific content areas. Criterion-referenced examinations replaced the norm-referenced approach. With criterion-referenced tests, grading is based on the criterion set by a panel of experts. The minimal passing score was set at 1600 with the maximum score being 3200 (Matassarini-Jacobs, 1989).

The newly developed NCLEX-RN was designed to measure competencies associated with the ongoing changes and technological advances in the health care delivery system. Those competencies inherent in the examination for safe and effective practice of nursing require knowledge of:

- (1) normal growth and development, (2) basic human needs, (3) coping mechanisms used by individuals, (4) actual or potential health problems, (5) effects of age, sex,

culture, ethnicity, and/or religion on health needs, and (6) ways by which nursing can assist individuals to maintain health and cope with health problems (National Council of State Boards of Nursing, INC., 1980, p. 1).

Other concepts and content integrated throughout the examination include management, accountability, life cycle, mental health, nutrition, pharmacology, pathophysiology, documentation, communication, teaching and the nursing process (Matassarini-Jacobs, 1989). In addition, competencies are tested at the cognitive levels of: knowledge, comprehension, application, and analysis. However, most test items are at the application and analysis levels (National Council of State Boards of Nursing, INC., 1980).

Following the second job analysis study in 1986, changes were made again in the NCLEX-RN in response to the expected competencies of the newly licensed nurses. The National Council Board of Nursing states that "major job analysis generally precede several other events in the cycle of test construction and validation; test plan revision; development of knowledge, skill, and ability statement; and re-evaluation of passing standard" (Issues, 1988, p. 3). These changes appeared in the revised licensure examination at the February 1988 administration. This test continues to use the criterion-referenced scoring format, however, actual scores are no longer reported. Performance on the revised examination is reported as "pass" or "fail" (Matassarini-Jacobs, 1989).



### Nursing Education in Baccalaureate Programs

In recent years, there have been increasing demands on institutions of higher education to devise and implement strategies to prepare better qualified graduates. Some of these demands have come from political, social, and economic pressures. Employers and consumers are continuously pressuring higher education administrators to reform their programs so that graduates will be more accountable and more competent in their chosen careers. Legislators, for example, are increasingly showing more interest in the competence of the practicing nurse. They feel that since the government partially shares in the cost of educating these licensed professionals, these practitioners should have the necessary proficiency to carry out their legal responsibility (Kelly, 1980).

Baccalaureate nursing education is experiencing pressures that are confronting many other disciplines. For example, many pre-nursing students are denied admission to the nursing major because of an insufficient knowledge base to meet admission criteria. Also, in some nursing programs, traditional admission criteria hamper the progression of students who otherwise might succeed in their academic performance. For instance, Aldag and Rose (1983) conducted a study to determine the relationship between age and the American College Test (ACT) scores to college grade point average and State Board scores. Their findings demonstrated

an age bias with significant and negative correlations between age and ACT scores. However, older students consistently had a larger proportion to graduate and pass the licensure examination than younger students who were more frequently admitted by traditional standards. One of their conclusions was that those (students) who are admitted by non-traditional criteria appear able to compete with those who are admitted by the traditional requirements.

Other issues facing the nursing profession are linked to broad national concerns. Among these are the continuous debate within the profession concerning the entry level for professional nursing, the declining enrollment in nursing education, the shortage of nurses, the increasing demand for nurses prepared at the baccalaureate level, and the nursing curriculum.

Several factors of interest affect the resolution of curriculum concerns in nursing. However, one of the critical foci is the number of new graduates who are able to move immediately into the practice of nursing. Problems in this area are reflected by a recent report on the decline in the overall pass rate on the nursing licensure examination in North Carolina (Tar Hill Nurse, 1988). This report indicates a decline in the pass rate among the 1987 graduates from all three levels of nursing: baccalaureate degree, associate degree, and diploma programs. The overall pass rate on the NCLEX-RN for 1987 North Carolina graduates dropped to a five-

year low of 86 percent. The greatest pass rate decline within this five-year period (1983 to 1987) was from 1986 to 1987. In 1986, the pass rate for all three types of North Carolina programs was 92 percent. However, the change in the pass rate of baccalaureate nursing programs declined from 88 percent in 1986 to 81 percent in 1987 (Tar Hill Nurse, January-February, 1988).

Nursing leaders and others also recognized the need to bring more professional status to nursing. In 1965, ANA published its first position paper in support of the baccalaureate degree being the entry level to professional nursing. Continuing to hold this premise, ANA (1979) stated these opinions about baccalaureate preparation of the nurse:

- (1) The scope of nursing practice is changing and expanding, and it is baccalaureate preparation that best equips the nurse to enter professional practice.
- (2) The availability of and accessibility to health care will not improve unless more nurses are equipped to function in a variety of health care settings. The depth and breadth of knowledge acquired while earning a bachelor's degree in nursing equips a nurse for beginning professional practice in any of the major health care settings.
- (3) Throughout nursing history, the need to base nursing education in institutions of higher learning has been stressed by nursing leaders and individuals and groups studying nursing education and nursing practice. Today there is increasing pressure from outside the profession to upgrade the standards of nursing practice. (ANA, 1979, p. 8)

In her support of baccalaureate education, Rosenfeld (1986) stated that "requiring baccalaureate degrees for entry into professional nursing will put nursing on (a) par with other professional groups," and that "without college degrees, nurses would have difficulty passing along the body of abstract knowledge now being uncovered" (p. 488). Kramer (1981) further distinguishes a difference in the function of the baccalaureate prepared nurse. She noted that:

... the goal of baccalaureate nursing education is to prepare a liberally educated person to function as a professional nurse in a variety of nursing roles and health care settings.

Kramer (1981) also pointed out that:

Most baccalaureate programs prepare graduates for functions inherent in five specific roles or positions; caregiver function - as staff nurse in hospital and community settings, the beginning managerial; leadership function - roles as team leader, assistant head nurse or nurse in centralized settings; the health promotion and health supervision function - (found) in positions in community health nursing, school nursing and mental health clinics; the teaching and counseling function; and the health-illness screening function. (p. 224)

In February 1982, NLN Board of Directors approved a statement specifying its position on the nursing roles-scope and preparation. The Board endorsed the minimum of a baccalaureate degree with a major in nursing as the requirement for professional nursing practice. In part, the position states:

Nursing as an occupation, in the broadest sense covers a wide range of activities that may be viewed as a

continuum beginning with simple nurturing tasks, progressing through increasingly complex responsibilities, and culminating in critical decision-making activities. To meet the reality of this wide range of responsibilities and activities, a corresponding range of nursing practice roles is required: these have come to be referred to as vocational, technical, and professional nursing practice.

For each nursing role, adequate pre-service preparation must be required. Since professional nurses are expected to provide the leadership for all nursing personnel, they need a broad background of knowledge and of clinical skills that will equip them to make independent judgments and critical decisions necessary in a complex health care delivery system.

More nurses with graduate preparation (i.e., master's and doctoral degrees) are required to provide leadership in nursing service, nursing education, and nursing research. In turn, greater numbers of baccalaureate graduates are required - not only by the increased complexity and scope of care, but also as a base for progression into graduate programs for the eventual assumption of leadership positions. (NLN position, 1982 p. 1)

Recognition of the baccalaureate as the minimum preparation needed for entry level positions in nursing has also received sanction from many other nursing and national groups. In the article on Historical Review of Positions in Baccalaureate Education, Blaney (1986) cited the American Association of Colleges of Nursing (AACN) support which urged other agency members to support baccalaureate preparation for professional nursing care.

As another means of upgrading and improving the quality of nursing education, nursing educators propose frequent and systematic evaluations of nursing programs. Felts (1986) felt that an assessment of nursing programs is important for many

diverse reasons. These may include "financial exigency in higher education in both the public and private sectors, the rights of students as consumers, the role of the liberal arts in professional curricula, faculty responsibility in curriculum development; the controversy of accountability in nursing education, career mobility, and the changing role of the health care provider" (p. 372).

Several authors of nursing programs (Poteet and Pollok, 1986; Stewart and Hluchyj, 1986; Waltz and McGurn, 1983) advocate that data-based program evaluation can identify areas where change is needed. Stewart and Hluchyj (1986), described their use of a program evaluation approach to study a small liberal arts school of nursing. They selected the discrepancy model to examine selected variables of the program. Their three faculty concerns for the study involved the admission and progression criteria, the prerequisites for entering the nursing major, and the content and sequence of the nursing curriculum.

One of the crucial curriculum and/or program issues that nursing educators must continue to address is the preparation of students who can, upon graduation, successfully pass the licensure examination. Toward this end, nursing educators are increasing their efforts to identify predictors and variables that influence students' successful outcomes. Measures of success most frequently include performance of graduates on the licensure examination and other means of academic per-

formance such as program completion, cumulative grade point average or grades in nursing theory and clinical courses. Hagen (1979) described how the licensure examination is tied into program evaluation of nursing programs. She stated that:

...although performance on this examination is not a complete and true reflection of the excellence of an educational program, it is a necessary hurdle that the graduates must successfully accomplish if they are to become a professional nurse. If a large proportion of graduates fail the SBTPE (previous licensure examination), then the program cannot be considered effective no matter what other positive qualities it possesses. Data on the performance of these examinations should be included in the evaluation of every program (p. 64).

#### Factors Related to the Licensure Examination and Academic Performance

Many studies are found in the literature on predictors of success on the previous licensure examination, the SBTPE. However, until recently only a few studies have been conducted to investigate similar predictors of success on the NCLEX-RN (Felt, 1986; Payne and Duffey, 1986; Quick, Krupa, and Whitley, 1985; Schoenfisch, 1983; Whitley and Chadwick, 1986 and Yang, Glick and McClelland, 1987). These authors identified similar predictive cognitive variables in their studies. They cited the following as the most common predictors on the NCLEX-RN: GPA in nursing courses, pre-entry GPA to the nursing major, and scores on the college entrance tests.

Prediction of academic success for nursing students has been of interest to the nursing profession for many years.

Burgess et al. (1972) were especially concerned with the ongoing evaluation of students' success in the baccalaureate program at the University of Kansas Medical Center as they described their second and third predictive studies. Burgess and Duffey (1969) conducted the first study which included two samples from nursing students who were admitted to the junior class in 1965, and 1966. These authors investigated 58 variables as predictors of grade point average (GPA) of subjects enrolled in Curriculum A: intellective (intelligence and creativity); interest (vocational interest); personality factors (personality traits, self-concept, and grade attitude); and educational (scholastic performance, scholastic ability, parents' education). A sample of 76 students admitted as juniors in 1965 comprised the experimental group (Group I), and 74 students admitted as juniors in 1966 were the cross-validation group (Group II).

Using correlation and multiple regression analysis, Burgess and Duffey (1969) reported the following findings: (1) a significant prediction of collegiate GPA using 20 of the original 58 variables (2) under cross-validation, the best five predictors (freshman and sophomore GPA, SCAT total, psychasthenia-MMPI, Kuder social service, and Kuder-musical) manifest only minimal shrinkage; and (3) the most single



significant variable in predicting collegiate nursing GPA was the combined freshman and sophomore (pre-nursing) GPA.

Burgess, Duffey and Temple (1972) described Studies II and III which provided' follow-up research on the original study conducted by Burgess and Duffey (1969). The purpose of the second study was to replicate the first study using subjects admitted as juniors in 1967 and 1968 who were enrolled in a revised curriculum (Curriculum B). Another purpose of the study was to determine the stability of the predictors found in the original study.

One change made in the second study was the selection of 56 variables instead of 58. Results of the data demonstrated that GPA could be predicted to a significant degree in a collegiate program of nursing. The five best predictors of GPA in the nursing program were identified as: (1) prenursing GPA, (2) the Cooperative School and Ability Test (SCAT), (3) psychasthenia (MMPI), (4) Kuder-social service, and (5) Kuder-musical. The single best predictor was the combined freshman and sophomore GPA. The authors warned that several aspects of Study II must be considered with caution. For example, of the 21 significant variables that were identified in Group I only 2 remained significant for Group II.

The third study reported by Burgess et al. (1972) included 55 variables with the exclusion of the prenursing GPA. This study was conducted to determine whether deletion of the previous GPA as a predictor of success would alter the

overall effectiveness of predicting success in the student samples used in the two previous studies. According to the investigators, a cross-validation of Study II yielded only minimal predictive shrinkage, and prenursing GPA again emerged as the most significant predictor. The conclusion drawn from Studies II and III indicates that grade point average emerged as the most single significant predictor of nursing school success. The fact that a single variable, freshman and sophomore GPA, accounted for most of the predictive variance indicates that a student's future GPA could be predicted by utilizing the former GPA. A second conclusion was that no data supported the relationship of nursing school GPA to professional success of which the ultimate goal was to predict the success of a practicing professional nurse. Several other studies, (Felts, 1986; Muhlenkamp, 1971; Perez, 1977; Whitley and Chadwick, 1986; Esry, 1987; Yang, Glick, McClelland, 1987), however, have examined the relationship of prenursing GPA to successful performance on the licensure examination and found positive significant relationships. In the first study by Muhlenkamp (1971), the seventh semester GPA was reported as the most significant predictor for each of the five SBTPE subtests. The second study revealed that the NLN Natural Science test score was the best predictor for all SBTPE examinations except Pediatric Nursing. Melcolm and Bausell's (1981) study also supported the relationship of the NLN Achievement Test to SBTPE performance when they found that NLN

Test scores were the best predictor of this licensure examination.

Schwirian (1976) examined nursing students' admission and prediction criteria in a two-part study. The first part included a comprehensive review of related literature from 1965 through 1975. These studies focused on characteristics that nursing students possessed prior to admission to the program, characteristics during their progression through the program, and characteristics at the completion of the program. In the second study, 150 national schools of nursing were surveyed and identified ACT scores, NLN prenursing examinations and SAT scores as predictors of academic achievement and SBTPE performance.

In another study of predictors associated with the licensure performance, Bell and Martindill (1976) used regression equations and cross-validation to predict scores on the SBTPE. Five NLN Achievement Tests were identified as predictors with a sample of 101 baccalaureate graduates between 1968 and 1972. These investigators reported that the NLN Nursing of Children Test and the Obstetric Nursing Test were consistently the best predictors of performance on the SBTPE.

Perez (1977) used freshman GPA along with 11 other variables in an effort to identify predictors of success on the SBTPE. Her study included 230 baccalaureate graduates of a liberal arts college during a six-year period (1968-1973).

Analysis of data indicated three variables that appeared most sensitive as predictors. ACT social science reading score, freshman GPA. and social science GPA were selected early by the stepwise regression analysis. Based on the findings from the study, the author suggested that further investigation take place to examine the relationship of reading ability as a predictor of SBTPE success, and that further study of SBTPE and ACT scores be conducted. Lee (1980) found similar results in a study of predictive variables in a sample involving eight ADN programs. Social science was the most consistent subtest score of the ACT. However, findings from a study conducted by Kruger (1980) showed inconsistent ACT results when no variable appeared as a specific predictor of performance on the SBTPE. Hayes' (1981) study indicated that academic success (measured by completion of the curriculum) was predicted by several cognitive variables, but freshman GPA accounted for the greatest amount of variance (37 percent).

The Intercollegiate Center in Spokane, Washington was the location of 501 baccalaureate students who participated in the study conducted by Stronck (1979). The purpose of the study was to compare and determine the degree of correlation between admission criteria and academic performance in the upper division courses. Academic performance was defined as nursing course grades, NLN tests, and SBTPE scores. Results of the study indicated that GPAs correlated at the .01 level of significance with all academic measures. Students with

baccalaureate degrees had significantly lower GPAs on general education courses than did students who had not earned a baccalaureate degree. However, GPA in nursing courses was a significant predictor of academic performance. Stronck (1979) concluded that the most appropriate predictor of future academic performance is past grade point average. Coetsee's (1979) finding of the GPA concurs with those of this study.

Using a sample of 198 subjects from a large midwestern baccalaureate program Seither (1980) sought to find valid predictors of academic and job performance. Academic performance was defined as cumulative grade point average and nursing licensure score. Seither (1980) noted that high school percentile rank demonstrated the highest predictive power with grade point average in biological and social sciences and cumulative grade point average. GPA in the biological science was the best predictor of each SBTPE score except Psychiatric Nursing.

In addition to looking at academic variables, Zanecchia (1981) was interested in the influence selected nursing faculty variables had on the successful performance of baccalaureate graduates. A sample of 1825 nursing graduates and 620 faculty were included in the study which covered the five-year period from 1975 to 1980. Zanecchia found a negative correlation between years of teaching experience and cumulative GPA. The author noted that, seemingly, faculty members with more recent experience with the licensure

examination were better able to prepare students for the test. Other findings of faculty attributes were that smaller faculties in baccalaureate nursing programs yielded a higher pass rate for students, and faculty productivity (semester credit hour generated) affected the multiple equation and added six points to the variance. Shepard (1990) also studied the relationship of faculty attributes to academic success when she investigated part-time faculty employment. The author found that the use of part-time faculty contributed to exposing nursing students to the latest technologies in (clinical) specialty areas. However, one concern reported by the administrators was an inability to find qualified part-time faculty.

Kissinger and Munjas (1982) identified verbal ability, vocabulary knowledge, convergent thinking ability, and field independent perceptual style as predictive factors in the use of the nursing process. The nursing process refers to a systematic process that is used in the performance of health care, and it involves assessment, analysis, planning, intervention, and evaluation. These authors cited the use of the nursing process as being crucial for the successful completion of the nursing program. Thompson's (1982) study revealed opposing views in examining reading ability as a predictor of academic success. Her data indicated the following results: (1) an inverse relationship between students' reading ability and grades in their initial clinical nursing course, (2) no

relationship between prior learning and their initial nursing course: and (3) a significant difference in the reading ability of subgroups of black students, students from other ethnic backgrounds and older students. Thompson concluded, therefore, that reading ability cannot be identified as a factor related to success in an initial nursing course.

In July, 1982, the revised version of the licensure examination, the NCLEX-RN, was given for the first time to replace the SBTPE. Previous researchers advocated replication of studies that identified predictors of success on the SBTPE for comparison of those predictors on the NCLEX. Recently, the literature has shown an increase in the number of studies that relate to predictors of success on the NCLEX-RN.

Mix (1983) was unable to find reliable multiple regression equations from the use of NLN Achievement Test scores for performance on either the revised test (NCLEX) or the SBTPE. The author conducted a study of associate degree graduates to examine predictors of the licensure examination. Twelve NLN Achievement tests, nursing GPA and ACT scores were studied to determine whether they predict success on the SBTPE for Group I, and to predict success on the NCLEX for Group II. The data revealed no reliable multiple regression equation for the NLN variables. However, the "Nursing Care III (Medical-Surgical Nursing)" entered both equations for Group I and Group II. The NLN variables were the best predictors, followed by nursing GPA and with the ACT last.

Breyer's (1984) study also supported the use of NLN tests to predict NCLEX performance. Findings from this study indicated that the NLN Comprehensive Nursing Achievement Test can predict success on the NCLEX for associate degree nurses (ADN) and diploma graduate nurses. The author further noted that use of a multiple regression equation could predict the performance of the ADN and diploma graduates with a relative degree of accuracy.

Most of the studies found in the literature used cognitive variables to predict performance on the licensure examination. Sharp (1984) continued this pattern when she studied data from 322 baccalaureate graduates of the University of Tennessee at Knoxville School of Nursing from 1974 through 1979. Predictors of SBTPE success included high school GPA, nursing GPA, and ACT standard scores - (English, mathematics, social science, natural science, and composite). Sharp found all variables to be predictive of the licensure examination. The strongest combination of predictors were GPA, ACT mathematics, and natural science scores.

A later study of associate degree graduates at Kansas State University was done by Felts (1985). She investigated age, high school rank, high school GPA, marital status, ACT scores, and college course grades to determine their relationship to NCLEX performance and grades in the nursing courses. Felts' findings were consistent with those of Sharp's (1984) in regards to high school GPA and ACT scores.



Schoenfisch (1983) investigated the relationship between 16 variables and NCLEX performance. The study included 406 graduates from nine baccalaureate nursing programs in Florida. Using Pearson Product Moment and discriminant analysis, the investigator found all variables to be correlated with successful NCLEX results. The best predictors, however, were GPA in nursing courses and composite SAT scores. The five variables which contributed significantly to the discrimination between the pass/fail rate on the SBTPE were GPA in nursing, SAT math, prenursing GPA, GPA in anatomy and physiology, and the number of clinical laboratory hours. Other investigators (Esry 1987; Krupa, Quick and Whitley 1988; Lessner 1985, and Moore 1989) reported GPA in nursing courses as a strong predictor of NCLEX performance. Porter (1984) combined specific components of the baccalaureate curriculum with entrance criteria and attrition rate to identify their relationship to programs' pass rate on the SBTPE. She surveyed 60 NLN accredited nursing programs. Her major finding was that the biological science courses were the only curriculum component which related significantly ( $r = -0.503$ ) to the programs' pass rate on the licensure examination. Anatomy, physiology, microbiology, nursing theory courses, and number of semester hours of clinical practice were identified as predictors of potential successful performance on the SBTPE.

Yocum and Scherubel (1985) compared individual course grades, GPAs, credit hours earned prior to admission, school

attended prior to admission, previous academic degree, and race to scores on the SBTPE. From the analysis of data for 139 baccalaureate graduates, they found that all clinical nursing theory GPAs except Medical-Surgical Nursing II demonstrated correlations with the SBTPE which ranged from  $r=.55$  to  $.68$  at the  $.01$  level of significance. Other findings reported were the following: (1) graduates with the highest pre-admission GPA also had the highest pass rate on the SBTPE; (2) a significant difference was found between the means of graduates who passed and those who failed at least one of the SBTPE; (3) a significant difference was found between school attended prior to admission for graduates who passed and those who failed the SBTPE; (4) a significant association was found between school attended, and race for graduates who passed and those who failed the examination; and (5) a significant difference was found between means of credit hours earned for graduates who passed and those who failed the examination.

Another study that investigated cognitive variables' associated with NCLEX performance was reported by Payne and Duffey (1986). The purpose of their study was to examine several cognitive variables to determine whether graduates of a baccalaureate nursing program who failed or were in jeopardy of failure on the NCLEX could have been identified as "risk" students during their undergraduate study. The investigators used cumulative data which were available at the time of admission at three points during the program and at graduation

as predictors of performance on the NCLEX. The University of North Carolina at Chapel Hill was the setting for selecting the subjects. The sample included 144 graduates of the class of 1983 and 139 graduates of the class of 1984.

Analysis of data revealed that the nursing GPAs were strong predictors of the NCLEX. The entrance GPA was a fairly good predictor and the SAT verbal was consistently a better predictor than the SAT math score. The results also identified the most important prediction points which appeared to be the mid-junior year, the end of the junior year, and the mid-senior year. The authors concluded that findings from the study suggest a useful approach for identifying "high risk" students fairly early in the program. This early identification can be valuable for selecting interventions to upgrade students' chances for successful performance on the NCLEX. Heupel (1986) found similar results in her study which revealed GPA to be the best predictor of success on the NCLEX for 228 nursing graduates.

Ferguson (1987) conducted a study to determine how well admission criteria to the nursing program predict program completion and performance on the licensure examination. A total of 9 demographic variables and 11 academic variables were selected as predictors of the two outcomes. A sample of 192 graduates of a major urban university over a three-year period (1981-1983) participated in the study. Predictor variables included the following: (1) GPAs for individual

prerequisite courses; (2) cumulative pre-professional GPA; (3) SAT scores; (4) high school rank; (5) location of residence (urban or nonurban); (6) type of high school attended (public or private); (7) location of high school attended (urban or nonurban); (8) type of (four or two year) and location of educational institution granting the greatest number of pre-professional credits; and (9) age, gender, ethnic heritage, work experience and previous degree(s) held.

Ferguson (1987) found that variables with the highest predictive power for program completion were: (1) location of place of residence, (2) type of institution which provided the pre-professional courses, (3) SAT verbal score, and (4) grade in Introduction to Sociology course. Variables highly related to success on the licensure examination were: (1) type of pre-professional educational institution, (2) grades in the Chemistry I and Introduction to Sociology courses, (3) pre-professional GPA, and (4) SAT verbal score.

Findings from her study led Ferguson to recommend that nurse educators continue testing predictive variables cited in this study and that other institutions offering the nursing major engage in comparative research. She further suggested that a more flexible and creative approach to the pre-professional curriculum warranted attention in the future (p.115).

In another study of predictors of NCLEX performance, Woodham and Taube (1986) noted that the SAT verbal score

revealed a significant positive relationship at the  $<.01$  level. According to these authors, 104 ADN graduates of a major midwestern state university during the period of May 1982 and May 1983 were subjects for the study. Other findings indicated that no significant correlations resulted when age at graduation, high school class rank percentile, and SAT math score were tested. In addition, all course grades for seven nursing courses demonstrated positive correlations with the SAT verbal score. The identity of the SAT verbal score as a predictor of successful performance on the NCLEX is consistent with several other research findings (Payne and Duffey, 1986: Quick, Krupa, and Whitney 1985). However, in a later study reported by Forman and Owen (1990), the SAT verbal score was not found to influence success on the NCLEX.

In addition to measuring the relationship between cognitive variables and academic performance, several studies were found in the literature to address the use of diagnostic tests as predictors. A study by Cloud-Hardaway (1988) revealed that the Mosby Assess Test, the Nelson Denny Reading Test, and the mean semester average were combined predictors which yielded the best estimate of a successful NCLEX score. Her study examined data from a sample of 558 ADN graduates who wrote the licensure examination in 1983 and 1984. The Mosby Assess Test was also found to be a significant predictor of NCLEX success in studies conducted by Lambert (1986), and McKinney et al. (1988).

Limited research has been focused predominately on the performance of minority graduates' success on the licensure examination. However, several investigators (Addison, 1982: Baldwin, 1987: Dell and Halpin, 1984: Lyons, 1985: McNally, 1979: and Outtz, 1979) sought evidence to support variables which were related to academic performance of black and/or other minority nursing graduates.

Using a sample of 110 baccalaureate graduates between the 1973-1977 time period, Outtz (1979) investigated measures to determine high school (HS)GPA's, HSGPA science courses, and SAT scores' influence on academic performance. Her findings included the following results: (1) a positive relationship was found between HS cumulative GPA and college GPA ( $r = .36$ ); (2) a positive correlation was found between HSGPA science courses and college GPA science courses with a reported  $r = .29$ ; (3) a positive correlation was found between SAT scores and SBTPE scores; (4) the college GPA emerged as the best predictor of success on the SBTPE; and (5) the SAT score was identified as the second best predictor of SBTPE success.

Likewise, Dell and Halpin (1984) found similar results for a sample of 456 black baccalaureate nursing students who were admitted to a private institution from 1970 through 1974. A second analysis of data involved 181 of the total sample who graduated and wrote the licensure examination. The authors found that HSGPA and SAT scores differentiated between successful and unsuccessful performance on the SBTPE of the

graduates. Another finding indicated that the NLN pre-nursing examination scores were influential in predicting success on the examination.

McNally (1979) cited several methodologies to remedy the deficiencies in traditionally black institutions, and thus enhance the opportunity for disadvantaged/minority students to complete a baccalaureate nursing program and pass the licensure examination. Her suggestions included providing students with selected learning, and with civic, cultural, professional, and personal skills. Sisca and Kerr (1984) also encouraged the use of good study habits, scientific testing techniques, and methods of relaxation during the testing period. These authors believe that such skills can increase the number of examinees who successfully pass the examination.

A study conducted by Lyons (1985) reported the relationship between several cognitive variables and nursing graduates' performance on the licensure examination in a predominately black institution. A sample of 271 graduates of Jacksonville State University from 1977 through 1982 was used for the study and was divided into three ability groups (from high ability to high risk). Data for the study included ACT scores, HSGPA, college GPA in prerequisite courses, HS chemistry and/or algebra grades, the need of remediation, attrition rate, and scores on the licensure examination.

Analysis of the data revealed the following findings:  
(1) a strong predictive relationship between students' ACT

scores and SBTPE performance followed by having taken HS science, chemistry and/or algebra and attaining a grade of "C" or better in the science courses; (2) no significant relationship between college GPA and SBTPE performance; (3) highest nursing GPA for Group I (high ability group) as compared to the lowest nursing GPA for Group III (high risk group); (4) greater need for remediation for Group III than for Group I; (5) higher success rate on the SBTPE for Group I than for Group III; and (6) lowest attrition rate for Group I than for Group III.

Addison's (1982) study focused on an investigation of factors associated with academic success of black nursing graduates. The purpose of her study was to identify new criteria that pointed to the likelihood of educational success of black inner city nursing students. Success was defined as program completion and successful performance on the NCLEX. Two associate degree programs were the setting for the subjects admitted during 1982 and 1983. Three hundred questionnaires were mailed with a 46.6 percent return rate. The questionnaire was designed to obtain information related to personal data, family and kinship, the community, education, and work experience.

Addison (1982) found that the following factors were related to the success of black inner city nursing ADN graduates: (1) age, work experience and value placed upon education; (2) source of income during enrollment in the



nursing program; (3) perception of membership in a particular social class; (4) number of dependent children; (5) presence of supportive family members living nearby; (6) type and cohesion of community in which students were reared; (7) interaction of the student with the community; (8) mother's work pattern outside the home; (9) educational preparedness for college, based upon one's ability to successfully pass timed examination in the areas of reading, mathematics, science and logic; and (10) location of high school. Social class was not a predictor of college attendance and successful program completion. Addison concluded that familial, cultural, and academic factors influence the likelihood of achievement of black students enrolled in inner city associate degree programs.

Baldwin (1987) also studied the relationship between academic success of black graduates from traditional black institutions and cognitive and noncognitive variables. Completion of the nursing program and success on the NCLEX were outcome criteria. A sample of 30 graduates from five baccalaureate nursing programs located in Florida, Georgia, Maryland, North Carolina and Virginia participated in the study. Graduates were administered the Tennessee Self-Concept Scale to measure their self-concept and Kolb's Learning Style Inventory to measure learning style. Cognitive variables were

examined by using the SAT verbal and math scores, and the college GPA.

The author found that college GPA and SAT math score were the best predictors of success on the NCLEX for the study population. No predictor was identified when academic performance was the outcome variable. Additional results indicated that learning style, cognition and motivation were found to predict group membership and discriminate between successful and unsuccessful performance of graduates on the NCLEX. A moderate correlation was reported between SAT math and verbal scores, and academic performance. No significant correlations were found between academic success and self-concept.

Baldwin (1987) concluded that cognitive and noncognitive variables were not statistically significant as predictors of NCLEX success and academic performance. College GPA and SAT math score were good predictors of successful performance on the licensure examination for black graduates. Different predictors emerged for success on program completion and the licensure examination, and speculation that noncognitive variables when added to cognitive variables will predict success on the NCLEX for black students. Cloud-Hardaway (1988) found in her study that prior practical nursing licensure was the most important predictor of black ADN graduates' NCLEX success. Three variables were also identified by Todd (1986) as being significantly related to

NCLEX success of black graduates when compared with white graduates from an ADN program. The variables which related to the NCLEX-RN success for black graduates but not for white graduates included the following: graduation from a higher quality high school, the type of financial support during college, and appropriate use of a tutor. Boyles (1986) reported the ACT scores as being most significant in predicting the pass rate on the licensure examination for blacks and other minority nursing graduates.

While the majority of studies on the academic performance of nursing students included cognitive variables, a growing number of researchers are investigating the relationship of personality attributes and other social influences. Hilbert and Allen (1985) measured the effect of a support system on NCLEX-RN performance. The purpose of their study was to examine the relationship among social support, test anxiety, self-esteem, and educational outcomes of cumulative grade point average and NCLEX scores.

A convenience sample of 124 subjects comprised the study population from a private university. Data were collected by use of the Social Support Inventory of Socially Supportive Behavior (ISSB) to measure students' supportive actions of their support network, the Coopersmith Self-Concept Scale to indicate self-esteem, and the Spielberger Test Anxiety Inventory to measure test anxiety. The t-test and Pearson correlation demonstrated the following results: (1)

no relationship was found between social support and GPA or NCLEX score, (2) a significant positive relationship existed between social support and self-esteem, and (3) no significant interaction between social support and test anxiety in relationship to GPA and NCLEX score.

Hilbert and Allen (1985) further noted that a significant inverse relationship existed between social support and test anxiety. A difference was cited between female and male correlations. Social support for female subjects was significantly correlated to self-esteem while social support for male subjects revealed a higher correlation with the outcome variables than for female subjects. Contrary to Hilbert and Allen's (1985) findings, Norton (1985) noted that personality measures such as self-esteem, social support loss, and negative life change events emerged as significant predictors of academic success for baccalaureate and associate degree graduates. Brown (1987) reported that attrition rate was reduced in an experimental group of high risk nursing students who participated in a support group throughout a semester. Also noted was a higher mean NCLEX score for the experimental group ( $\bar{X} = 1816.88$  for the experimental group and  $\bar{X} = 1547.77$  for the control group). Phillips (1987) found a high correlation between test anxiety and NCLEX results ( $-.33$ ) in the study of 87 subjects from four baccalaureate programs during the spring and summer of 1984. When test anxiety was added to marital status, they accounted for 22.9% of the variance in the performance on the NCLEX.

There is also a belief that the social and academic environment affect the success rate of nursing graduates. For example, Fotos (1986) provided some support for this tenet when she conducted a study to investigate the relationship of the college climate to the performance on the NCLEX. Her findings led to the suggestion that a constraining, restrictive and orderly environment may be conducive to achievement on the licensure examination.

#### Summary

The review of selected literature on the history of the nursing licensure examination, nursing education in baccalaureate programs, and academic performance revealed three major concerns. The current licensure examination, NCLEX-RN, measures cognitive knowledge and skills, and the graduates' potential for functioning effectively in various professional settings. This comprehensive examination measures competencies relative to a wide range of areas. Among them are the following: health problems, coping mechanism, growth and development, life cycle, management, accountability, mental health, communication, teaching and the affect of culture, ethnicity, and/or religious needs.

A major concern of baccalaureate degree programs in North Carolina has been the recent decline in the overall pass rate on the licensure examination. Nursing leaders and educators nationwide continue their efforts to provide quality education and the development of competent practitioners. At the same

time, a strong support remains viable throughout the profession for baccalaureate education to prevail as the entry level to professional nursing.

The literature search indicated that there has been ongoing investigation of numerous measures which influence the academic success of nursing students and/or graduates. Program completion, GPAs in course work and performance on the licensure examination were the most frequently cited indices of academic success that were examined. The majority of these studies were conducted in reference to the SBTPE, however, research associated with the performance on the NCLEX-RN has currently increased.

Cognitive variables such as the SAT, pre-admission GPA, and ACT scores have been well documented as predictors of academic success in nursing programs (Baldwin, 1987; Burgess et al., 1969; Ferguson, 1987; Lyons, 1985; Muhlenkamp, 1971; Outta, 1979; Payne and Duffey, 1986; Quick, Krupa, and Whitney, 1985; Schoenfisch, 1983; Schwirian, 1976; Seither, 1980; Sharp, 1984; and Stronck, 1979). In addition, high school rank and GPA, grade point averages in natural science courses, and nursing GPA were found by several authors to be highly correlated with successful academic performance (Dell and Halpin, 1984; Ersy, 1987; Felts, 1985; Mix, 1983).

Review of the literature further indicated that success in nursing programs is related to a number of noncognitive variables (Addison, 1986; Aldag and Rose, 1982; Lee, 1980;

Woodham and Taube, 1986). Several investigators reported that adding these variables to the cognitive variables can increase their predictive power (Hayes, 1981; Lee, 1980; Phillips, 1987;). The influence of personality measures such as coping style, self-esteem, and support system on nursing students' academic performance was included in a number of studies by different authors (Brown, 1987; Hilbert and Allen, 1985; Holeman, 1986; and Norton, 1985). Success on the licensure examination was also predicted from the NLN Achievement Tests, and the Mosby Assess Test (Lambert, 1986; Hardaway, 1988; and McKinney et al., 1988).

Several cognitive and noncognitive variables that were identified in the literature as predictors of academic success of nursing students served as a basis for the variables used in this study. Further examination of these variables will assist in the validation of previous predictors that were found to relate to the performance on the NCLEX-RN.

### CHAPTER III

#### METHODOLOGY

The general purpose of this study was to examine changes in performance on the licensure examination by graduates of one of North Carolina's state university nursing programs. The nursing program has been approved by the North Carolina Board of Nursing and is nationally accredited by the National League for Nursing (NLN). The program is an agency member of the NLN and the Council of Baccalaureate and Higher Degree Programs. The investigator sought to explore several explanations for the change in the success rate of graduates' performance on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) during two consecutive three-year time periods (1981-1984 and 1984-1987).

One specific purpose of the study was to determine whether there were differences in initial ability of graduates enrolled during the two time periods. A second purpose was to determine whether there were differences in selected variables that were associated with the nursing program offered during the two time periods. A third purpose was to determine whether graduates' perceptions of the program differed during the two time periods.



This chapter describes the subjects, research questions, research design, instrumentation, sources of data, procedure, and data analysis.

### Subjects

Subjects for the study were from Winston-Salem State University's (WSSU) baccalaureate nursing program located in the northwestern region of North Carolina. WSSU is one of 16 institutions comprising the University of North Carolina system. The subjects for this study included all 1981-1987 WSSU generic nursing graduates. A total of 62 generic graduates completed the program and wrote the NCLEX-RN during this period. Twenty-eight of the graduates completed the program between 1981-1984, and all of them were successful in passing the NCLEX-RN on the initial attempt. Thirty-four graduates completed the program between 1984-1987. Twenty-eight of these 34 graduates earned passing scores on the NCLEX-RN examination, and six were unsuccessful in obtaining a passing score on the first writing.

Graduates of the two time periods (1981-1984 and 1984-1987), were divided into two major groups. Group A includes subjects who graduated in the 1981-1984 period and Group B includes subjects who graduated in the 1984-1987 period. Group B was further divided into two cohort groups: cohort B1 contains subjects who were successful on the NCLEX-RN during the 1984-1987 period, cohort group B2 contains subjects who were unsuccessful during the same period.

The subjects were also characterized by a number of traits which included both genders, traditional and non-traditional graduates, different ethnic origin, and transfer and non-transfer students.

#### Research Questions

The research questions formulated from the study's purposes included the following: (1) Were there initial differences in the characteristics at the time of their admission to the nursing major between the students enrolled during the 1981-1984 and those enrolled during the 1984-1987 periods? (2) Were there differences between the nursing program offered during the 1981-1984 and the 1984-1987 periods? (3) Were there differences in the students' perceptions of the nursing program of those enrolled during the 1981-1984 and those enrolled during the 1984-1987 period?

#### Research Design

This study was a longitudinal, ex post facto design. The longitudinal nature related to the examination of data over a six-year time period.

Data were examined on the following selected variables to address the three research questions:

- (1) Admission criteria to the nursing major: SAT verbal scores, cumulative GPA in general education courses, reading level, and completion of general education courses

- (2) Demographic factors: age, marital status, and previous college experience, number of courses repeated
- (3) Program changes:
  - a. faculty credentials and employment status
  - b. faculty turnover
  - c. faculty/student ratio
  - d. course revisions/sequencing
  - e. budget allocations
- (4) Graduates' perceptions of individual situations.

Data were examined to determine whether there were differences in the perceptions of the subjects relative to the nursing program. The questionnaire provided data for this analysis.

#### Questionnaire

A questionnaire developed by the investigator included nine sections and two open-ended questions. The questionnaire was employed to elicit the subjects' perceptions of their nursing program and of any special situations which they may have experienced.

At the inception of the questionnaire's development, nursing faculty were invited to participate by responding to a list of broad categories provided by the investigator. They were requested to make suggestions and comments which they

felt might be relevant to the nursing program and to the graduates' performance on the licensure examination. A majority of faculty members provided valuable written feedback useful in the development of the questionnaire.

The first revision of the questionnaire was circulated to the nursing faculty for review. Several subsequent revisions followed. Information contained in the questionnaire was divided into the following categories: curriculum, graduates, faculty, course content, fellow classmates, NCLEX examination, and educational resources. In addition, statements relating to individual student situations which incorporated study habits, work experience, and experience with the preparation for the NCLEX-RN were included on the questionnaire. The format for the questionnaire was then prepared on the microcomputer utilizing the WordPerfect word processing package.

Instructions for the first eight sections of the questionnaire requested the subjects to use the following Likert-type rating scale: Strongly Agree was rated 5, Agree was rated 4, Uncertain was rated 3, Disagree was rated 2, and Strongly Disagree was rated 1. Section one contained four items relating to the nursing program's curriculum. Section two contained eight items pertaining to individual situations such as study habits, and academic assistance, (one item in section two was discarded due to improper language).

Scores for the Likert Scale were reversed for items 6, 7, 8, 9 and 11 to accommodate the negative nature of these items. As a result, a respondent's rating of Strongly Agree for these five items was scored 1 instead of 5. Section three contained nine items which related to the nursing faculty. Sections four and five included six items each. Section four referred to nursing courses and section five referred to fellow classmates. Section six which included learning resources contained five items. Information on the NCLEX-RN experience appeared in the four items of section seven and in the five items of section eight. The questionnaire included thirteen "yes" and "no" questions and two open-ended questions (see Appendix A).

#### Sources of Data

Data were collected from two primary sources. One source was graduates' records located in the office of the nursing program. Prior approval to use the records to gather data for the study was obtained from the Vice Chancellor for Academic Affairs (see Appendix B). The second source for collecting data was the questionnaires that were completed and returned to the investigator. The university's budget office was a third source to provide data relative to budget allocations. A personal profile form was devised to record demographic data (see Appendix C).

Data associated with faculty credentials, faculty/student ratio, and program changes were obtained from the Director's

reports, history of the program, and from the university's catalogs. The North Carolina Board of Nursing reports provided data on the results of the NCLEX-RN.

#### Procedure

The questionnaire was initially mailed to a pilot group of 10 baccalaureate nursing graduates two months prior to the actual mailing to the study population. Eight of the ten graduates selected for the pilot study were not involved with either the 1981-1984 or the 1984-1987 time periods, and were graduates from a baccalaureate nursing program in the University of North Carolina system. The other two graduates in the pilot study were 1985 graduates of WSSU's nursing program. Because no changes were made as a result of the pilot study, data from the two WSSU graduates were included in the major study.

A cover letter explaining the study's purpose accompanied the questionnaires sent to the pilot group. The letter asked respondents to check the questionnaire for clarity, clearness, and readability. Also the letter requested the respondents to note the amount of time required to complete the questionnaire and to suggest any changes.

All participants in the pilot study returned the questionnaire within a two-week period. No revisions were necessary based upon the feedback from the pilot group. The amount of time reported to complete the questionnaire ranged from 10-30 minutes with an average of 15 minutes.

On May 30, 1988, the questionnaire, a cover letter and a self-addressed stamped envelope were mailed to the study population for whom current addresses were available (see Appendix B). The investigator was unable to locate current addresses for four of the 62 subjects, therefore, a total of 58 questionnaires were mailed. The investigator maintained a master listing of the subjects. This list contained the codes of each subjects' questionnaire and was used to identify the returned questionnaires. No names appeared on the questionnaire to insure the confidentiality of the subjects.

A second mailing to subjects who had not returned their questionnaire was conducted three weeks following the first mailing. Telephone calls were also made to these subjects to encourage their response. The contents of the mailing remained essentially the same with the exception that the follow-up letter was revised and the color of the second questionnaire was yellow (see Appendix D). Also a digit was added to the code to indicate the second mailing.

#### Data Analysis

Data were analyzed using the SPSSX package from the Academic Computer Center at The University of North Carolina at Greensboro. The t-test and frequency distribution were employed.

The t-test was used to compare the 1981-1984 and 1984-1987 groups on selected variables related to admission criteria, demographic data, program changes, and perceptions

of the program as experienced by the subjects. Frequency distributions were used to describe data related to demographics and to the "yes" and "no" responses on the questionnaires. Data from the groups of the two time periods were compared. Also data from two cohort groups within the 1984-1987 time period were compared (see Appendix E). Comparisons were made to determine whether there were significant differences between the groups.

#### Summary

This chapter outlined the methodology used for this study. The research design was an ex post facto, longitudinal design. The study examined two, three-year time periods to determine whether selected variables provide an explanation for changes in the performance on the NCLEX-RN for those graduates who took the examination during the two time periods. Subjects were divided into two groups according to which two, three-year time period they took the examination.

The first group consisted of the 28 graduates who had a perfect pass performance on the NCLEX-RN for the three consecutive years of 1981-1984. The second group included the 34 graduates who demonstrated a declining trend on the NCLEX-RN pass rate during the 1984-1987 three-year time period.

Several variables associated with admission criteria, program changes, and graduates' perceptions of the program were examined in an attempt to address the study's three research questions. Data were collected from two primary



sources - graduates' records and a questionnaire that was developed by the investigator. The questionnaire was tested on a pilot group of 10 baccalaureate graduates prior to mailing it to the study population. Eight of the participants in the pilot group were not affiliated with either three-year time period. Additional information on faculty credentials and turnover, faculty/student ratio, and program changes was obtained from the nursing Director's materials and reports that were located in the nursing office.

Statistical techniques for analyzing the data included the t-test and frequency distributions.

## CHAPTER IV

### ANALYSIS OF DATA

This study examined data to identify possible factors that related to changes in the performance on the NCLEX-RN. Data were collected on sixty-two graduates of one baccalaureate program during two time periods. Answers were sought for three research questions: (1) Did graduates within the two time periods differ in their initial abilities at the time of admission to the nursing program? (2) Did program changes for the two time periods affect the graduates' NCLEX-RN performance? and (3) Did the graduates of the two time periods differ in their perceptions of individual situations relative to the nursing program?

Information was obtained from two primary sources. The records of graduates which were located in the nursing office of a baccalaureate granting institution served as one source of information, and a questionnaire designed by the investigator represented a second source of data. The Statistical Package for the Social Science (SPSSX) was used to analyze the data. The results are reported in the following sections: analysis of admission criteria and demographic data, analysis of program changes, and analysis of the questionnaire.

### Analysis of Admission Criteria and Demographic Data

The first investigation of the study was to determine if student characteristics might be related to a change in the performance of graduates of a baccalaureate program on the NCLEX-RN during two time periods. To examine this problem, the following research question was formulated:

Research question 1: Were there initial differences in the characteristics, at the time of their admission to the nursing major, between the students enrolled during the 1981-1984 and those enrolled during the 1984-1987 periods?

The variables used to investigate this question were the: SAT-V, GPA in prerequisite general education courses, reading level, completion of general studies requirements, age at graduation, marital status, prior educational experience, and need to repeat a nursing course. The programs for t-tests for independent samples and frequencies were used to analyze the data.

Generic graduates of the two time periods were divided into three groups for comparison (see Appendix D). Group A consisted of the 28 nursing graduates from the 1981-1984 time period all of whom obtained a perfect pass rate on their initial writing of the NCLEX-RN. Group B1 contained 28 of the 34 nursing graduates from the 1984-1987 time period who were successful on their first writing of the NCLEX-RN. The six of the 34 nursing graduates from the 1984-1987 time period who had unsuccessful performance on their initial writing of the NCLEX-RN comprised Group B2.

Table 1 shows the NCLEX-RN mean scores for Groups A, B1, and B2. Group A (successful graduates during the 1981-1984 time period) had the highest mean score (2118.4) when compared with Group B1 (successful graduates during the 1984-1987 time period) and Group B2 (unsuccessful graduates during the 1984-1987 time period). Group A and Group B1 had mean scores well above the minimum passing score of 1600. Group B2 had a mean score of 1479.8 which was far below the minimum passing score of 1600. The data also revealed that the scores of graduates in Group B1 were much more varied than those of Group A and Group B2.

Table 1

NCLEX-RN Mean Scores for Groups A, B1 and B2

| Group | N  | Mean   | Standard<br>Deviation |
|-------|----|--------|-----------------------|
| A     | 28 | 2118.8 | 243.4                 |
| B1    | 28 | 2016.4 | 269.8                 |
| B2    | 6  | 1479.8 | 93.8                  |

Comparisons of Groups A, B1, and B2 were made to ascertain if there were differences in the initial characteristics upon admission to the nursing program, between the groups enrolled during the two time periods. Data were analyzed by use of the t-test for independent samples and by frequency distribution. Table 2 shows the results of the t-

tests for SAT-V, SAT-M, prenursing GPA, reading level, and completion of general studies requirements between Groups A and B1. Observed t-values for these variables were as follows: (1) SAT-V =  $-.66$ , (2) SAT-M =  $-.48$ , (3) pre-nursing GPA =  $.11$ , (4) reading level =  $1.23$ , and (5) General Studies =  $-.85$ . The data revealed no significant differences between Groups A and B1 regarding the admission criteria of SAT-V, prenursing GPA, reading level, and completion of general studies requirements.

As shown in Table 2, the mean SAT-V score and the mean SAT-M score for Group B1 were higher than those of Group A. Although the SAT-M score was not one of the admission criteria for the nursing program, this variable was included in the analysis because previous studies found that the SAT-M score was a significant predictor of performance on the NCLEX-RN (Baldwin, 1987; Schoenfisch, 1983).

In Table 3, the admission criteria were compared for Groups A and B2. The observed t-values for the indicated variables were as follows: (1) SAT-V =  $.83$ , (2) prenursing GPA =  $-.42$ , (3) reading level =  $2.01$  and (4) General Studies. Completion =  $-2.94$ . The findings indicated a significant difference at the  $p < .01$  level, between the completion of general studies requirements for Groups A and B2 with Group B2 yielding a higher mean but a less favorable completion rate. The higher mean resulted in a lower completion rate because the coding for completion of general studies was "1" if the student had completed this requirement and "2" if not.

Table 2

Summary t-Test of SAT-V, SAT-M, Prenursing GPA, Reading Level, and General Studies Completion Between Groups A and B1

| Variable                               | Mean | Standard<br>Deviation | t    | p Value |
|--|------|-----------------------|------|---------|
| SAT-V                                  |      |                       |      |         |
| Group A                                | 446  | 56.4                  |      |         |
| Group B1                               | 457  | 59.9                  | -.66 | .513    |
| SAT-M <sup>a</sup>                     |      |                       |      |         |
| Group A                                | 389  | 71.0                  |      |         |
| Group B1                               | 399  | 85.7                  | -.48 | .634    |
| Prenursing GPA                         |      |                       |      |         |
| Group A                                | 2.94 | .40                   |      |         |
| Group B1                               | 2.93 | .34                   | .11  | .915    |
| Reading<br>Level                       |      |                       |      |         |
| Group A                                | 13.4 | 1.25                  |      |         |
| Group B1                               | 13.1 | .94                   | 1.23 | .223    |
| Gen Studies<br>Completion <sup>b</sup> |      |                       |      |         |
| Group A                                | 1.07 | .26                   |      |         |
| Group B1                               | 1.14 | .36                   | -.85 | .397    |

Note. Group A = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1981-1984 period.

Group B1 = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

<sup>a</sup>SAT-M was not an admission criterion.

<sup>b</sup>A lower mean score indicates a greater general studies completion rate.

There were no significant differences in the mean SAT-V, prenursing GPA or the reading level between these two groups but the data did reveal a substantial difference in the reading levels of the two groups. This difference approached a  $p < .05$  significance level. Graduates in Group A tended to have higher mean SAT-V scores and lower prenursing GPAs than did graduates in Group B2. An interesting finding, however, was a significant difference in the mean SAT-M score ( $p < .05$ ) between Groups A and B2, although this was not one of the admission requirements.

A profile of admission criteria and NCLEX-RN scores was created for students in Group B2 (Table 4) to examine possible individual differences on these admission standards and NCLEX scores. Table 4 shows that all six graduates met the pre-nursing GPA of 2.6, the SAT-V score of 390, and the 11th grade reading level. The SAT-V scores ranged from 390 to 460. As shown in Table 4, the SAT-M scores were lower than the SAT-V scores and ranged from 240 to 400. The prenursing GPA ranged from 2.7 to 3.4. NCLEX-RN scores ranged from 1369 to 1593 which is below the minimum passing level of 1600.

Results of the t-tests indicated no significant differences in the mean SAT-V, prenursing GPA, and reading level, when Group B1 was compared with Group B2. Data in Table 5 revealed these observed t-values for the indicated variables: (1) SAT-V = 1.18, (2) prenursing GPA = -.56 (3) reading level = 1.71, (4) completion of General Studies

Table 3

Summary of t-Test for SAT-V, SAT-M, Prenursing GPA, Reading Level, and General Studies Completion Between Groups A and B2

| Variable                            | Mean | Standard Deviation | t     | p Value |
|-------------------------------------|------|--------------------|-------|---------|
| SAT-V                               |      |                    |       |         |
| Group A                             | 446  | 56.4               |       |         |
| Group B2                            | 427  | 30.1               | .83   | .415    |
| SAT-M <sup>a</sup>                  |      |                    |       |         |
| Group A                             | 389  | 71.0               |       |         |
| Group B2                            | 317  | 56.8               | 2.315 | .027*   |
| Prenursing GPA                      |      |                    |       |         |
| Group A                             | 2.9  | .40                |       |         |
| Group B2                            | 3.0  | .29                | -.42  | .676    |
| Reading Level                       |      |                    |       |         |
| Group A                             | 13.4 | 1.25               |       |         |
| Group B2                            | 12.4 | .86                | 2.01  | .053    |
| Gen Studies Completion <sup>b</sup> |      |                    |       |         |
| Group A                             | 1.1  | .26                |       |         |
| Group B2                            | 1.5  | .55                | -2.94 | .006**  |

Note. Group A = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1981-1984 period.

Group B2 = Graduates (n = 6) who performed unsuccessfully on the of the NCLEX-RN at their initial writing during the 1984-1987 period.

<sup>a</sup>SAT-M was not an admission criterion.

<sup>b</sup>A lower mean score indicates a greater general studies completion rate.

\*Significant at the  $p < .05$  level.

\*\*Significant at the  $p < .01$  level.



Table 4

Comparison of SAT-V, SAT-M, Reading Level, Prenursing GPA, and NCLEX-RN Scores for Group B2

| Variables      | Subjects |      |      |      |      |      |
|----------------|----------|------|------|------|------|------|
|                | A        | B    | C    | D    | E    | F    |
| SAT-V          | 450      | 460  | 390  | 390  | 440  | 430  |
| SAT-M          | 280      | 360  | 400  | 310  | 240  | 310  |
| Reading Level  | 11.4     | 12.9 | 12.9 | 12.9 | 12.9 | 11.1 |
| Prenursing GPA | 2.7      | 3.4  | 2.7  | 3.0  | 3.3  | 3.0  |
| NCLEX-RN score | 1435     | 1593 | 1584 | 1369 | 1495 | 1403 |

requirements = -2.02, and (5) SAT-M = 2.24. The finding for completion of general studies requirements approached a  $p < .05$  significant level. This indicated that Groups B1 and B2 differed considerably in their general studies completion rate with Group B2 yielding the larger mean. As mentioned before, the admission criteria did not include the SAT-M score. However, the mean SAT-M score did differ significantly between Group B1 and Group B2, at the .05 probability level with Group B1 having the higher mean. Other findings showed a trend toward a higher mean SAT-V score and a better mean reading level for Group B1 when compared to Group B2. Of particular interest, in comparing these two groups, was the finding of a lower mean prenursing GPA score for Group B1 (successful graduates).

Table 5

Summary t-Test of SAT-V, SAT-M, Prenursing GPA, Reading Level, and General Studies Completion Between Groups B1 and B2

| Variable                             | Mean | Standard Deviation | t     | p Value |
|--------------------------------------|------|--------------------|-------|---------|
| SAT-V                                |      |                    |       |         |
| Group B1                             | 457  | 59.9               |       |         |
| Group B2                             | 427  | 30.1               | .18   | .245    |
| SAT-M <sup>a</sup>                   |      |                    |       |         |
| Group B1                             | 399  | 85.7               |       |         |
| Group B2                             | 317  | 56.8               | 2.24  | .032*   |
| Prenursing GPA                       |      |                    |       |         |
| Group B1                             | 2.9  | .34                |       |         |
| Group B2                             | 3.0  | .29                | -.56  | .581    |
| Reading Level                        |      |                    |       |         |
| Group B1                             | 13.1 | .94                |       |         |
| Group B2                             | 12.4 | .86                | 1.71  | .098    |
| Gen. Studies Completion <sup>b</sup> |      |                    |       |         |
| Group B1                             | 1.1  | .36                |       |         |
| Group B2                             | 1.5  | .55                | -2.02 | .052    |

Note. Group B1 = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

Group B2 = Graduates (n = 6) who performed unsuccessfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

<sup>a</sup>SAT-M was not an admission criterion.

<sup>b</sup>A lower mean score indicates a greater general studies completion rate.

\*Significant at the  $p < .05$  level.

Table 6 provides a statistical analysis of demographic variables (i.e., age, marital status, prior educational experience, and the need to repeat a nursing course) between Group A (successful graduates) and Group B1 (unsuccessful graduates). The following observed t-values were found: (1) age =  $-.37$ , (2) marital status =  $.30$ , (3) prior education =  $-.97$ , (4) repeat course =  $1.15$ . Concerning the demographic variables, there were no significant differences between Groups A and B1. In fact, age, marital status, and prior educational experience mean scores were quite similar for the two groups. Even though both groups were successful in passing the NCLEX-RN on their initial attempt, data showed a pattern in which Group A needed to repeat a nursing course more frequently than did Group B1.

Table 7 shows a summary of demographic variables (i.e., age, marital status, prior education, and need to repeat a nursing course) for Groups A and B2. There were no significant differences found between these two groups. Nevertheless, the higher prior educational experience mean score indicated that Group A had completed more college courses than had Group B2 before their admission to the nursing program. Also, the need to repeat a nursing course was higher for Group B2 than for Group A.

Table 8 shows demographic data for Groups B1 and B2. The need to repeat a nursing course was the only variable which was significant ( $p < .05$ ) for the observed t-value =  $-2.55$ ,

Table 6

Summary t-Test of Age, Marital Status, Prior Education, and Repeat Nursing Course Between Group A and B1

| Variable                     | Mean | Standard Deviation | t    | p Value |
|------------------------------|------|--------------------|------|---------|
| AGE                          |      |                    |      |         |
| Group A                      | 27.1 | 7.8                |      |         |
| Group B1                     | 27.8 | 7.4                | -.37 | .713    |
| Marital Status               |      |                    |      |         |
| Group A                      | 1.8  | .44                |      |         |
| Group B1                     | 1.7  | .46                | .30  | .768    |
| Prior Education <sup>a</sup> |      |                    |      |         |
| Group A                      | 2.0  | 1.1                |      |         |
| Group B1                     | 2.3  | 1.1                | -.97 | .339    |
| Repeat Course <sup>b</sup>   |      |                    |      |         |
| Group A                      | .32  | .48                |      |         |
| Group B1                     | .19  | .40                | 1.15 | .254    |

Note. Group A = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1981-1984 period.

Group B1 = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

<sup>a</sup>Prior Education refers to graduates who were either a 2nd degree student, a transfer student, and/or an LPN (licensed practical nurse) while enrolled in the nursing program.

<sup>b</sup>Repeat Course refers to the average number of times a nursing course was repeated.

between the two groups. This finding indicated that during the 1984-1987 time period, graduates from Group B1 (successful) differed significantly from Group B2 (unsuccessful) in the need to repeat nursing courses in that fewer graduates from Group B1 needed to repeat a nursing course than did those in Group B2. An interesting result is also noteworthy in relation to the two groups who were successful on the NCLEX-RN. For example, Group B2 differed significantly from Group B1 but not from Group A with respect to repeated nursing courses.

Overall, the findings indicate some significant differences between Group A (successful graduates from the 1981-1984 period) and Group B2 (unsuccessful graduates from the 1984-1987 period). Nursing graduates in the first group, A, had a significantly better general studies completion rate and mean SAT-M score than did those in the second group, B2. The mean SAT-M score was also significantly higher for Group B1 (successful graduates, 1984-1987) than for Group B2 (unsuccessful graduates, 1984-1987), and the general studies completion rate was significantly more favorable for Group B1 than for Group B2. Nursing graduates in Group B2 tended to have SAT-V scores that ranged from 390 to 460 and SAT-M scores that ranged from 240 to 400.

#### Analysis of Program Changes

The second problem addressed by the study was to determine if there were differences in changes in the program as related to changes in the successful and unsuccessful

Table 7

Summary t-Test of Age, Marital Status, Prior Education and Repeat Nursing Course Between Groups A and B2

| Variable                        | Mean | Standard<br>Deviation | t     | p Value |
|---------------------------------|------|-----------------------|-------|---------|
| AGE                             |      |                       |       |         |
| Group A                         | 27.1 | 7.8                   |       |         |
| Group B2                        | 26   | 3.6                   | .48   | .634    |
| Marital<br>Status               |      |                       |       |         |
| Group A                         | 1.8  | .44                   |       |         |
| Group B2                        | 1.8  | .41                   | -.42  | .674    |
| Prior<br>Education <sup>a</sup> |      |                       |       |         |
| Group A                         | 2.0  | 1.1                   |       |         |
| Group B2                        | 1.5  | 1.2                   | .92   | .366    |
| Repeat<br>Course <sup>b</sup>   |      |                       |       |         |
| Group A                         | .32  | .48                   |       |         |
| Group B2                        | .67  | .52                   | -1.59 | .121    |

Note. Group A = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1981-1984 period.

Group B2 = Graduates (n = 6) who performed unsuccessfully on the NCLEX-RN during the 1984-1987 period.

<sup>a</sup>Prior Education refers to graduates who were either a 2nd degree student, a transfer student, and/or an LPN (licensed practical nurse) while enrolled in the nursing program.

<sup>b</sup>Repeat Course refers to the average number of times a nursing course was repeated.

Table 8

Summary t-Test of Age, Marital Status, Prior Education, and Repeat Nursing Course Between Groups B1 and B2

| Variable                     | Mean | Standard Deviation | t     | p Value |
|------------------------------|------|--------------------|-------|---------|
| AGE                          |      |                    |       |         |
| Group B1                     | 28   | 7.4                |       |         |
| Group B2                     | 26   | 3.6                | .74   | .462    |
| Marital Status               |      |                    |       |         |
| Group B1                     | 1.7  | .46                |       |         |
| Group B2                     | 1.8  | .41                | -.59  | .563    |
| Prior Education <sup>a</sup> |      |                    |       |         |
| Group B1                     | 2.3  | 1.1                |       |         |
| Group B2                     | 1.5  | 1.2                | 1.48  | .149    |
| Repeat Course <sup>b</sup>   |      |                    |       |         |
| Group B1                     | .19  | .40                |       |         |
| Group B2                     | .67  | .52                | -2.55 | .016*   |

Note. Group B1 = Graduates (n = 28) who performed successfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

Group B2 = Graduates (n = 6) who performed unsuccessfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

<sup>a</sup>Prior Education refers to graduates who were either a 2nd degree student, a transfer student, and/or an LPN (licensed practical nurse) while enrolled in the nursing program.

<sup>b</sup>Repeat Course refers to the average number of times a nursing course was repeated.

\*Significant at the  $p < .05$  level.

performance of nursing graduates on the NCLEX-RN. To investigate this problem, the following research question was formulated:

Research question 2: Were there differences in the nursing program offered between the 1981-1984 period and the 1984-1987 period?

The variables selected to examine this question included the number of faculty, faculty credentials, full-time/part-time faculty status, faculty turnover, faculty/student ratio, course revisions, and budgetary allocations.

Table 9 presents data which summarize a comparison of the faculty profile in terms of number of faculty, academic preparation, new faculty, and faculty turnover. These data include variables within two time periods. As noted in Table 9, there was a slight decrease in the percentage of full-time faculty during the first time period. In the first time period (1981-1984), the percentage of full-time faculty changed from 100 percent in 1982 to 83.3 percent in 1984. Table 9 also shows that in the second period (1984-1987) the percentage of full-time faculty increased from 76.9 percent in 1985 to 91.7 percent in 1987. During the second period, part-time faculty decreased from 23.1 percent to 8.3 percent, while during the first period part-time faculty increased from 0 percent to 16.7 percent. All faculty members for both time periods had a master's degree which was the minimal requirement for employment. At the end of the first period



(1981-1984), 8.3 percent of the faculty had earned the doctorate degree compared to 25 percent for the end of the second period (1984-1987).

Overall, for the first period, 8.3 percent of the full-time faculty were new while the total new full-time faculty in the second period was 24.4 percent (7.7% in 1986 and 16.7% in 1987). New part-time faculty comprised 16.7 percent of faculty in the first time period (hired in 1984) compared with 8.3 percent in the second time period (hired in 1986). Faculty turnover was similar in the two time periods. It ranged from 16.7 percent to 27.3 percent in the first time period (1981-1984) compared with a range of 15.4 percent to 25 percent in the second time period (1984-1987).

Faculty/student ratio was based on the ratio of faculty members to students in the clinical practice area. In North Carolina, the acceptable standard is a ratio of 1:10 (North Carolina Board of Nursing - Approval of nursing programs: Process and Standards, 1988). The acceptable standard, referred to as an approval ratio, is usually established by the State Boards of Nursing in each state. Table 10 contains the faculty/student ratio for this study. For both time periods the average faculty/student ratio was 1:5.

There are some distinct advantages of a small ratio when compared to the maximum number established by the state approval agency. One advantage, which might enhance the learning experience, is the exposure of students to

Table 9

Comparison of Faculty Profile by Number, Academic Preparation,  
New Faculty, and Faculty Turnover

| Year      | Full-time and<br>Part-Time Faculty<br>(including New Faculty) |             | Academic<br>Preparation |             | New<br>Faculty          |             | Faculty<br>Turnover <sup>b</sup> |
|-----------|---|-------------|-------------------------|-------------|-------------------------|-------------|----------------------------------|
|           | FT  | PT          | MSN                     | DOC         | FT                      | PT          |                                  |
| 1981-1982 | 11<br>(100)   | 0<br>(0)    | 11<br>(100)             | 0<br>(0)    | 0<br>(0)                | 0<br>(0)    | 3<br>(27.3)                      |
| 1982-1983 | 12 <sup>a</sup><br>(100)                                      | 0<br>(0)    | 12<br>(100)             | 1<br>(8.3)  | 1 <sup>a</sup><br>(8.3) | 0<br>(0)    | 2<br>(16.7)                      |
| 1983-1984 | 10<br>(83.3)  | 2<br>(16.7) | 12<br>(100)             | 1<br>(8.3)  | 0<br>(0)                | 2<br>(16.7) | 3<br>(25)                        |
| 1984-1985 | 10<br>(76.9)  | 3<br>(23.1) | 13<br>(100)             | 2<br>(15.4) | 1<br>(7.7)              | 0<br>(0)    | 2<br>(15.4)                      |
| 1985-1986 | 10<br>(83.3)  | 2<br>(16.7) | 12<br>(100)             | 3<br>(25)   | 2<br>(16.7)             | 1<br>(8.3)  | 3<br>(25)                        |
| 1986-1987 | 11<br>(91.7)  | 1<br>(8.3)  | 12<br>(100)             | 3<br>(25)   | 0<br>(0)                | 0<br>(0)    | 3<br>(25)                        |

Note. <sup>a</sup>Only one faculty member was employed during the spring semester.

<sup>b</sup>Faculty turnover refers to faculty on study leave, resignation, or retirement.

FT = Full-time Faculty, PT = Part-time Faculty, MSN = Master of Science in Nursing, DOC = Doctoral Degree.

Percentages in parenthesis.

individualized attention. On the other hand, a frequent disadvantage, cited by the university's governing board, relates to the fact that small enrollments are not cost effective.

Table 11 shows a distribution of semester hours for the two time periods. As shown in Table 11, there was a two-semester hour shift between the lower division and the upper division during the 1984-1987 time period when compared to no changes taking place during the 1981-1984 time period.

The total number of semester hours required to complete the program remained the same for both time periods. Comparing the number of courses that were either added, deleted, or altered, there were none for the 1981-1984 time period. However, five changes took place within the lower and upper division during 1984-1987. One change in the lower division involved two alterations: (1) moving a two semester hour course from the upper division, and (2) substituting a three semester hour professional course in place of an elective. A second change included deleting one three semester hour upper division course and integrating its content into several other designing a new course and altering a six semester hour professional course.

A summary of budgetary allocations by percentage change (increase or decrease) appears in Table 12. An overall 12.3 percent increase occurred during the 1981-1984 time period which is an expectation with regard to the concurrent increase

Table 10

Summary of Faculty/Student Ratio for Two Time  
Periods (1981-1984 and 1984-1987)

| Year      | Faculty/Student Ratio | Mean        |
|-----------|-----------------------|-------------|
| 1981-1982 | 1 : 3                 |             |
| 1982-1983 | 1 : 5                 | 1 : 5       |
| 1983-1984 | 1 : 6                 | (1981-1984) |
| 1984-1985 | 1 : 4                 |             |
| 1985-1986 | 1 : 6                 | 1 : 5       |
| 1986-1987 | 1 : 5                 | (1984-1987) |

of student enrollment of 48 percent in the nursing program during the first time period. Likewise, an 18.1 percent increase in budgetary allocations occurred during the 1984-1987 period; however, student enrollment increased only 12.7 percent during this time. Although a greater increase in enrollment was noted in the 1981-1984 time period when compared to the 1984-1987 time period, the corresponding percentage increase in budgetary allocation was not comparable to the percentage increase that was observed in the student enrollment for the first period. This finding is perhaps related to factors such as the amount of overall budgetary allocation from the University of North Carolina General Administration or related to inflation.

Table 11

Distribution of Semester Hours and Course Revisions for Two Time Periods (1981-1984 and 1984-1987)

| Year      | Semester Hours            | No of Courses Added,<br>Deleted, Altered |
|-----------|---------------------------|--|
| 1981-1984 | Lower Division - 65 (51%) | 0  |
|           | Upper Division - 62 (49%) | 0  |
|           | Total - 127 SH            | 0  |
| 1984-1987 | Lower Division - 67 (53%) | 2  |
|           | Upper Division - 60 (47%) | 3  |
|           | Total - 127 SH            | 5  |

For the most part, the data analysis showed that several changes occurred in the nursing program in terms of faculty profile, course revisions, budgetary allocations, and student enrollment during the two time periods of this study (1981-1984 and 1984-1987). Regarding the faculty profile, the analysis revealed that the most pronounced change occurred during the second time period (1984-1987). These changes included an increase in the percentage of full-time faculty from 76.9 percent to 91.7 percent compared with a decrease from 100 percent to 83.3 percent in the first time period (1981-1984). Concurrently, there was a decrease in the percentage of part-time faculty from 23.1 percent to 8.3 percent in the second time period (1984-1987) compared with

Table 12

Summary of Budgetary Allocations for Two Time Periods  
(1981-1984 and 1984-1987)

| Academic<br>Year | Budget<br>Percentage Change | Student Enrollment<br>Percentage Change |
|------------------|-----------------------------|---|
| 1981-1984        | + 12.3%                     | + 48%                                   |
| 1984-1987        | + 18.1%                     | + 12.7%                                 |

an increase from 0 percent to 16.7 percent in the first time period (1981-1984). Overall, there was a decrease in the percentage of new full-time faculty and new part-time faculty during the second time period (1984-1987). The findings also showed an increase in the percentage of doctoral prepared faculty from 15.4 percent to 25 percent during the second time period (1984-1987) compared with an increase from 0 percent to 8.3 percent in the first time period (1981-1984). In the first time period (1981-1984), there was a slightly higher percentage of turnovers (a low of 16.7% to a high of 27.3%) than during the second period (a low of 15.4% to a high of 25%).

The analysis revealed that several course revisions were made in the second time period (1984-1987) compared with none in the first time period (1981-1984). These changes included (1) moving a two semester hour course from the upper division, (2) substituting a three semester hour nursing course for a

free elective, (3) integrating the content of a three semester hour course, and (4) developing a new three semester hour nursing course in the upper division.

Regarding budgetary allocations for the nursing program, the findings showed a larger increase (18.1%) in the second period (1984-1987) than (12.3%) in the first period (1981-1984). However, the larger percentage increase in enrollment (48%) occurred in the first time period (1981-1984) rather than (12.7%) in the second time period (1984-1987).

#### Analysis of the Questionnaire

The third problem investigated in this study was to determine the graduates' perceptions of various aspects of the nursing program over two time periods. The research question formulated to examine this problem was as follows:

Research question 3: Were there differences in the students' perceptions of the nursing program of those enrolled during the 1981-1984 period and those enrolled during the 1984-1987 period?

A questionnaire composed of 63 items was used to obtain information for analysis. The first 48 statements were divided into eight sections. Respondents were requested to use a Likert-type rating scale for the items contained in the eight sections. Scores for the rating scale ranged from 1 (Strongly Disagree) to 5 (Strongly Agree) for seven of the eight sections. For section two, the scale was reversed for six of the eight items (6, 7, 8, 9, and 11) - - 1 represented

Strongly Agree and 5 indicated Strongly Disagree. This change was made to accommodate the negative nature of the items in section two. A rating of 2 represented Agree, a 3 represented Uncertain, and a 4 represented Disagree.

In section I, the items dealt with information relating to the program's curriculum. This section contained four items. The range of scores for section I was 4 to 20. Activities experienced in the nursing program comprised the nine items of section II. Scores could range from 10 to 45. Questions associated with the faculty were specified in section III and contained nine items with a possible score which ranged from 9 to 45. Section IV included six items which dealt with course work. Fellow classmates as a support system comprised section V which included six items. Section VI contained five items which related to learning resources. Information associated with the program's activities in preparation for the NCLEX-RN was included in section VII. This section had four items. In section VIII, there were five items that related to specific behavior experienced while taking the NCLEX-RN.

Twelve "yes" and "no" questions which related to information on work experience, family responsibilities, and NCLEX-RN experience comprised another portion of the questionnaire. In the final part, three open-ended questions requested responses pertaining to personal problems encountered and strengths and weaknesses of the program. The open-ended questions were analyzed using content analysis.



A description of the subjects' response rate to the questionnaire is presented in Table 13. Of the 58 questionnaires mailed, 38 responses were returned for a 64 percent return rate. Compared to the 1981-1984 period (56 percent of return) the larger percent of returns came from graduates during the 1984-1987 time period (74 percent of return). Five of the six years had over a 50 percent return rate.

The observed *t* values along with means and standard deviations for Group A (1981-1984) and combined Groups B1 and B2 (1984-1987) are presented in Table 14. The perceptions of the groups (Group A and combined Groups B1 and B2) did not differ significantly regarding the program's curriculum, educational activities, faculty members, nursing courses, fellow classmates, program resources, program preparation for NCLEX-RN, and behavior during NCLEX-RN. However, the trend was toward a greater satisfaction of faculty competence (Table 14, category 3), and benefits of nursing courses (Table 14, category 4) for Group A. The items that dealt with the graduates' perceptions of the faculty (category 3) stated that faculty members: (1) were knowledgeable in their specialty area; (2) overall, were prepared for class; (3) used a variety of teaching methods to present content; (4) kept abreast of current trends in their specialty; (5) served as role models; (6) overall, encouraged independent thinking; (7) provided feedback that was valuable for continuing learning; (8) validated students' ongoing progress; and (9) provided timely feedback to promote learning.

The six items in category four (nursing courses) indicated that nursing courses (1) were organized in a logical fashion; (2) progressed from simple to complex content; (3) included content that was relevant to future needs; (4) included content that stimulated students to think; (5) included content from a variety of sources; and (6) measured attainment of objectives through evaluation.

When Groups B1 and B2 were compared regarding their perceptions of the nursing program (Table 15), they differed significantly on category eight which was concerned with behavior during the NCLEX-RN administration ( $p < .05$ ).

In category eight, questionnaire items dealt with graduates' behavior during the administration of the NCLEX-RN. These items stated that the graduate (1) spent too much time answering some questions; (2) was rushed to finish the examination; (3) experienced periods of mental blocking during the examination; (4) was anxious before taking the examination; and (5) was anxious during the examination. The findings indicated that graduates in Group B1 felt significantly more comfortable and less anxious while taking the NCLEX-RN than did those in Group B2. The data also revealed some differences ( $p < .076$ ) for category six that related to program resources for these two groups. Ratings on program resources revealed that learning resources (1) were accessible; (2) included current information; (3) included

Table 13

Subjects' Response Rate to the Questionnaire

| Year      | Number of Generic<br>Graduates | Mailed | Number<br>Returned % |
|-----------|--------------------------------|--------|----------------------|
| 1981-1982 | 6                              | 6      | 6 (100)              |
| 1982-1983 | 8                              | 8      | 5 (63)               |
| 1983-1984 | 14                             | 13     | 4 (30)               |
| 1984-1985 | 17                             | 15     | 12 (80)              |
| 1985-1986 | 9                              | 9      | 7 (78)               |
| 1986-1987 | 8                              | 7      | 4 (57)               |
| Total     | 62                             | 58     | 38 (64)              |

media material to support learning; (4) were maintained in working condition; and (5) included quality media materials. Graduates in Group B1 (successful graduates) felt more satisfied that the program resources were sufficient than did those in Group B2 (unsuccessful graduates).

Table 16 presents the frequency of responses to individual situations for Groups A, B1, and B2. Twelve questions (items 49 to 60) requiring "yes" or "no" responses dealt with the NCLEX-RN experience, work experience, and family responsibilities.

Question 49 asked if the respondent participated in an NCLEX-RN review. Over 50 percent of the respondents in each group indicated that they had participated. The largest

percentage occurred in Group B1 which reported 83 percent (15) while the smallest percent 3(60%) was reported by Group B2. All three groups reported similar percentages for question 50 regarding whether the review enhanced NCLEX-RN performance. An interesting finding of 100 percent (5) was reported by Group B2 to question 51 stating whether the respondent finished the NCLEX-RN compared to 67 percent (10) for Group A and 83 percent (15) for Group B1. The largest percent for question 52 "Were you confident in being ready for the NCLEX-RN?" was 94 percent (17) reported by Group B1 followed by 87 percent (13) for Group A, and 40 percent (2) for Group B2. All groups reported that respondents were employed while enrolled (question 53) with the lowest percentage occurring in Group B2-2(40%) and with the highest percentage in Group B1 15(83%). Over 50 percent of the graduates in each group participated in the NCLEX-RN review (question 49), with Group B1 (successful graduates, 1984-1987) showing the greatest percentage of participants 15(83%) which was followed by Group A 11 (73%, successful graduates, 1981-1984).

Question 54 asked whether "working made studying difficult." A slight difference was shown among the three groups. Group A reported that 47 percent (7) felt that work hampered their study, while 39 percent (7) of the graduates in Group B1, and 40 percent (2) in Group B2 felt that their study was handicapped by working. Group A (successful graduates) and Group B2 (unsuccessful graduates) reported that

Table 14

Summary t-Test of Perceptions of Nursing Program Between Group A and Combined Groups B1 and B2

| Variable                               | Mean | Standard<br>Deviation | t    | p Value |
|--|------|-----------------------|------|---------|
| 1. Program Curr                        |      |                       |      |         |
| Group A                                | 14.6 | 2.8                   |      |         |
| Groups B1 & B2                         | 13.3 | .6                    | 1.19 | .242    |
| 2. Educational<br>Activities           |      |                       |      |         |
| Group A                                | 44.5 | 3.8                   |      |         |
| Group B1 & B2                          | 42.7 | 5.2                   | 1.15 | .256    |
| 3. Faculty Members                     |      |                       |      |         |
| Group A                                | 38.4 | .7                    |      |         |
| Group B1 & B2                          | 36.0 | 3.4                   | 1.78 | .084    |
| 4. Nursing Courses                     |      |                       |      |         |
| Group A                                | 25.6 | 2.5                   |      |         |
| Group B1 & B2                          | 24.3 | 1.7                   | 1.78 | .084    |
| 5. Fellow Classmates                   |      |                       |      |         |
| Group A                                | 26.6 | 2.8                   |      |         |
| Group B1 & B2                          | 24.7 | 3.4                   | 1.67 | .103    |
| 6. Program Resources                   |      |                       |      |         |
| Group A                                | 20.6 | 2.4                   |      |         |
| Group B1 & B2                          | 21.0 | 2.6                   | -.46 | .646    |
| 7. Program preparation<br>for NCLEX-RN |      |                       |      |         |
| Group A                                | 17.4 | 2.2                   |      |         |
| Group B1 & B2                          | 17.0 | 2.1                   | .49  | .627    |
| 8. Behavior during<br>NCLEX-RN         |      |                       |      |         |
| Group A                                | 16.5 | 21.6                  |      |         |
| Group B1 & B2                          | 18.1 | 11.5                  | -.99 | .329    |

Note. Group A = Graduates (n = 15) who performed successfully on the NCLEX-RN at their initial writing during the 1981-1984 period.

Group B1 = Graduates (n = 18) who performed successfully on the NCLEX-RN, and Group B2 = Graduates (n = 5) who performed unsuccessfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

Table 15

Summary t-Test of Perceptions of Nursing Program Between Groups B1 and B2

| Variable                                   | Mean | Standard<br>Deviation | t     | p Value |
|--|------|-----------------------|-------|---------|
| 1. Program Curr                            |      |                       |       |         |
| Group B1                                   | 13.5 | 3.1                   |       |         |
| Group B2                                   | 12.4 | 5.3                   | -.63  | .536    |
| 2. Educational<br>Activities               |      |                       |       |         |
| Group B1                                   | 42.3 | 5.6                   |       |         |
| Group B2                                   | 43.8 | 4.1                   | .54   | .592    |
| 3. Faculty Members                         |      |                       |       |         |
| Group B1                                   | 36.3 | .8                    |       |         |
| Group B2                                   | 35.0 | 1.4                   | -.76  | .453    |
| 4. Nursing Courses                         |      |                       |       |         |
| Group B1                                   | 24.5 | 1.5                   |       |         |
| Group B2                                   | 23.6 | 2.1                   | -1.14 | .267    |
| 5. Fellow Classmates                       |      |                       |       |         |
| Group B1                                   | 24.8 | 3.3                   |       |         |
| Group B2                                   | 24.4 | .3                    | -.24  | .810    |
| 6. Program Resources                       |      |                       |       |         |
| Group B1                                   | 21.5 | 2.7                   |       |         |
| Group B2                                   | 19.2 | 1.3                   | -1.86 | .076    |
| 7. Program preparation<br>for the NCLEX-RN |      |                       |       |         |
| Group B1                                   | 17.3 | 2.2                   |       |         |
| Group B2                                   | 16.0 | 1.4                   | -1.22 | .235    |
| 8. Behavior during<br>NCLEX-RN             |      |                       |       |         |
| Group B1                                   | 16.7 | 4.3                   |       |         |
| Group B2                                   | 23.0 | 6.6                   | 2.56  | .018*   |

Note. Group B1 = Graduates (n = 18) who performed successfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

Group B2 = Graduates (n = 5) who performed unsuccessfully on the NCLEX-RN at their initial writing during the 1984-1987 period.

\* Significant at the  $p < .05$  level

Table 16

**Frequency of Perceptions by Individual Situations For Groups A, B1, and B2**

| Question  | 1981-1984           | 1984-1987            |                     |
|---|---------------------|----------------------|---------------------|
|   | Group A<br>(n=15) % | Group B1<br>(n=18) % | Group B2<br>(n=5) % |
| 49. Participated in<br>NCLEX-RN review              |                     |                      |                     |
| Yes   | 11(73)              | 15(83)               | 3 (60)              |
| No  | 4(27)               | 3(17)                | 2 (40)              |
| 50. Review enhanced<br>NCLEX performance            |                     |                      |                     |
| Yes   | 10(67)              | 11(61)               | 3 (60)              |
| No  | 1(07)               | 4(22)                | —                   |
| 51. Finished NCLEX-RN                               |                     |                      |                     |
| Yes   | 10(67)              | 15(83)               | 5(100)              |
| No  | 4(27)               | 2(11)                | —                   |
| 52. Was confident in<br>being ready for<br>NCLEX-RN |                     |                      |                     |
| Yes   | 13(87)              | 17(94)               | 2 (40)              |
| No  | 2(13)               | 1(6)                 | 3 (60)              |
| 53. Employed while<br>enrolled                      |                     |                      |                     |
| Yes   | 12(80)              | 15(83)               | 2 (40)              |
| No  | 3(20)               | 3(17)                | 3 (60)              |
| 54. Working made<br>studying difficult              |                     |                      |                     |
| Yes   | 7(47)               | 7(39)                | 2(40)               |
| No  | 5(33)               | 8(44)                | —                   |
| 55. Worked more than<br>2-4 days/week               |                     |                      |                     |
| Yes   | 6(40)               | 4(22)                | 2(40)               |
| No  | 6(40)               | 10(56)               | —                   |
| 56. Worked in health<br>care agency                 |                     |                      |                     |
| Yes   | 11(73)              | 14(78)               | 2(40)               |
| No  | 1(07)               | —                    | —                   |

(table continues)

Table 16 continued

| Question   | 1981-1984           | 1984-1987            |                     |
|--|---------------------|----------------------|---------------------|
|  | Group A<br>(n=15) % | Group B1<br>(n=18) % | Group B2<br>(n=5) % |
| 57. Work enhanced knowledge                          |                     |                      |                     |
| Yes  | 11(73)              | 12(67)               | 2(40)               |
| No   | —                   | 2(11)                | —                   |
| 58. Had major family responsibilities while enrolled |                     |                      |                     |
| Yes  | 7(47)               | 10(56)               | 2(40)               |
| No   | 8(53)               | 8(44)                | 3(60)               |
| 59. Family responsibilities made studying difficult  |                     |                      |                     |
| Yes  | 5(33)               | 7(39)                | 2(40)               |
| No   | 2(13)               | 2(11)                | —                   |
| 60. Personal problems interfered with education      |                     |                      |                     |
| Yes  | 4(27)               | 7(39)                | 3(60)               |
| No   | 11(73)              | 10(56)               | 2(40)               |

40 percent of the respondents in each group worked more than 2-4 days/week (question 55), and that the majority of respondents in Groups A and B1 worked in a health care agency (question 56). Also, in response to question 57, over fifty percent in Group A (11) and Group B1 (12) reported that work enhanced their knowledge, while 40 percent (2) in Group B2 indicated the same. Of further interest to this question was the finding that only one group (Group B1) reported a negative response. Group B1 was the only group indicating that over 50 percent (10) of the respondents had major family



responsibilities while enrolled in the nursing program (question 58). Major family responsibilities were cited by 47 percent (7) in Group A and 40 percent (2) in Group B2. The highest percentage of respondents reporting that family responsibilities made studying difficult (Question 59) was indicated by Group B2-2(40%) compared to a low of 33 percent (5) which was reported by Group A. In response to question 60, Group B2 (unsuccessful) reported the highest percentage of personal problems encountered which interfered with their education 3(60%), while Group A (successful) noted the lowest percent 4(27%).

Table 17 shows the number of respondents in Groups A, B1, and B2 who identified strengths and weaknesses of the nursing program. Twenty-six of the respondents provided 36 comments about the strengths and weaknesses of the program. One graduate offered four comments, one graduate offered three comments, ten graduates made two comments and the remaining four graduates suggested one comment. The most frequently cited strengths by respondents from any of the three groups included (1) small class size, (2) qualified faculty (3) frequent testing, and (4) updated resources. Likewise, the most frequently identified weaknesses by any group were: (1) limited clinical practice; and (2) too few assigned clients. A number of additional strengths and weaknesses were identified but only by one respondent. Strengths such as a caring staff, consistent teaching technique, and faculty

provided extra time with students were identified. Several weaknesses noted by only one respondent included choices such as too few hands-on experience, use of part-time faculty, and students pushed to the extreme.

The analysis of the questionnaire produced two significant results. In terms of graduates' perceptions (Table 14), Group A (successful graduates, 1981-1984) believed that nursing courses (category four) more adequately prepared them for the profession and the licensure examination than did graduates in combined Groups B1 (successful graduates, 1984-1987) and B2 (unsuccessful graduates, 1984-1987). In the second time period (1984-1987) - Table 15, Group B1's (successful graduates) behavior during the NCLEX-RN administration was significantly more comfortable and less anxious than that of Group B2 (unsuccessful graduates).

In terms of graduates' perceptions (Table 16), Group A (successful graduates, 1981-1984) felt that the NCLEX review more adequately enhanced their performance on the licensure examination 10(67%) than did graduates in the second time period (1984-1987) in Group B1 11(61%) and in Group B2 3(60%). Part-time employment in a health care setting (Table 16) was perceived as being more beneficial to enhancing the knowledge base of successful graduates in Group A 11(73%) than that of successful graduates in Group B1 12(67%) and in Group B2 2(40%). Successful graduates in Group B1 10(56%) tended to report more family responsibilities than successful graduates

Table 17

Frequency Comparison of Strengths and Weaknesses of Nursing Program By Groups A, B1, and B2

| Strengths and Weaknesses                     | 1981-1984           | 1984-1987            |                     |
|--|---------------------|----------------------|---------------------|
|  | Group A<br>(n=15) % | Group B1<br>(n=18) % | Group B2<br>(n=5) % |
| <b>Strengths</b>                             |                     |                      |                     |
| 1. Small class size                          | 3                   | 3                    | -                   |
| 2. Qualified faculty                         | 2                   | 5                    | -                   |
| 3. Frequent testing                          | 2                   | 1                    | 1                   |
| 4. Individual attention to students          | 1                   | 2                    | -                   |
| 5. Updated resources                         | 1                   | 1                    | 1                   |
| 6. Good learning resource facility           | -                   | 2                    | -                   |
| 7. Caring staff                              | 1                   | -                    | -                   |
| 8. Faculty provided extra time with students | 1                   | -                    | -                   |
| 9. Testing enhanced thinking                 | -                   | 1                    | -                   |
| 10. Consistent teaching technique            | 1                   | -                    | -                   |
| 11. Independent and group study encouraged   | -                   | 1                    | -                   |
| 12. Students allowed to work                 | 1                   | -                    | -                   |

Table continues

Table 17 continued

| Strengths and Weaknesses                              | 1981-1984           | 1984-1987            |                     |
|---|---------------------|----------------------|---------------------|
|   | Group A<br>(n=15) % | Group B1<br>(n=18) % | Group B2<br>(n=5) % |
| <b>Weaknesses</b>                                     |                     |                      |                     |
| 1. Limited clinical practice                          | 1                   | 5                    | 1                   |
| 2. Too few assigned clients                           | 2                   | 1                    | 1                   |
| 3. Too few hands-on experiences                       | -                   | -                    | 1                   |
| 4. Lack of some psychomotor skills                    | 1                   | -                    | -                   |
| 5. Students pushed to the extreme                     | 1                   | -                    | -                   |
| 6. Improvement needed in faculty/student relationship | -                   | -                    | 1                   |
| 7. Too many proficiency examinations                  | -                   | -                    | 1                   |
| 8. Too much emphasis placed on SAT entrance score     | -                   | 1                    | -                   |
| 9. Lack of close relationship with classmates         | -                   | 1                    | -                   |
| 10. Use of part-time faculty                          | 1                   | -                    | -                   |
| 11. Lack of cohesiveness between faculty and students | -                   | 1                    | -                   |

in Group A 7(47%) and unsuccessful graduates in Group B2 2(40%). A substantially larger percentage of unsuccessful graduates in Group B2 3(60%) reported that personal problems interfered with their education than did those successful graduates in Group A 4(27%) and in Group B1 7(39%).

Some successful graduates in Group A (1981-1984) and in Group B1 (1984-1987) listed small class size and qualified faculty as strengths of the nursing program. Some graduates in each group also listed frequent testing and updated resources as strengths. Limited clinical practice and too few assigned clients were listed as weaknesses by the three groups.

#### Summary

This chapter analyzed data to determine whether selected variables might relate to changes in the performance on the NCLEX-RN in a baccalaureate nursing program during two time periods. Data were collected from graduates' records and from a questionnaire developed by the investigator and examined in response to the three research questions. The t-test for independent samples, frequency distribution, and content analysis were used to analyze the data.

The first research question was concerned with whether there were initial differences in the characteristics of graduates prior to their admission to the nursing program during two time periods. The admission variables examined were the SAT-V score, prenursing GPA, reading level, and completion

of the general studies requirements. Demographic variables investigated included age, marital status, prior educational experience, and the need to repeat a nursing course.

In comparing the admission criteria, the findings did not indicate a significant difference between Groups A and B1; however, Group B1 tended to have higher SAT-V and SAT-M means than did Group A. When Group A was compared with Group B2, it was found that Group A was significantly better than Group B2 on completion of general studies requirements ( $p < .01$ ). No significant differences were found on the SAT-V and the prenursing GPA between Groups A and B2. The data revealed a higher mean SAT-V for Group A than for Group B2. While the SAT-M was not one of the admission criteria, the data did reveal a significant difference at the .05 probability level for this variable between Groups A and B2. Further, a surprising finding was that Group A (successful graduates) had a slightly lower mean prenursing GPA than those in Group B2 (unsuccessful graduates).

The data also revealed a substantial difference on the completion of general studies requirements between Group B1 (successful graduates) and B2 (unsuccessful graduates). Group B1 had a lower mean completion rate score than did Group B2; however, because of the coding, explained earlier, the lower mean for Group B1 constitutes higher general studies completion rate. No significant differences were found on the SAT-V, reading level or prenursing GPA for these two groups.

However, in comparing the two groups, the pattern which emerged showed that Group B1 (successful graduates) had a higher mean SAT-V score than did Group B2 (unsuccessful graduates). An interesting finding was that the prenursing mean GPA score for Group B1 was lower than that for Group B2. Although nursing graduates in Group B2 tended to meet all prenursing admission requirements (Table 4), their profile revealed SAT-M scores ranging from 240 to 400. Graduates in Group B2 also had SAT-V scores ranging from 390 to 460, reading levels of 11.0 or higher, and a prenursing GPA of 2.7 or higher.

Analysis of data relating to demographic variables indicated that only one variable -- need to repeat a nursing course -- showed a significant difference between Group B1 and Group B2 at the .05 level. Fewer graduates in Group B1 needed to repeat a nursing course. Other demographic data which included age, marital status, and prior educational experience failed to indicate that Group A differed significantly from either Group B1 or Group B2. Neither did Group B1 differ significantly from Group B2 on these demographic variables. In general, the findings from the demographic data revealed that graduates in Group A (successful graduates, 1981-1984) and Group B1 (successful graduates, 1984-1987) tended to be slightly older than did those in Group B2 (unsuccessful graduates, 1984-1987), while slightly more graduates in Group B2 were married than those in Group B1. The average number of

married graduates in Groups A and B2 was the same. One significant difference found was that Group B2 significantly repeated more nursing courses than did Group B1 ( $p < .05$ ) and had a higher mean repeat course score than did Group A.

The second research question concerned whether program changes were different for the graduates between the two time periods. Results of the data revealed that little change occurred in the number of full-time or part-time faculty employed during the two time periods. In terms of faculty credentials, all faculty had earned master's degrees, and doctoral prepared faculty increased from 8.3 percent in the 1981-1984 period to 25 percent in the 1984-1987 period. Data on full-time faculty showed a decrease from 100 percent to 83 percent in the first time period to an increase from 76.9 to 91.7 percent during the second time period. Employment of part-time faculty decreased during the second period from 23.1 percent to 8.3 percent compared to the increase from 0 percent to 16.7 percent in the first time period. Faculty turnover occurred during the first time period (25%) and during the second time period (27%).

The data revealed that a larger proportion of courses were either added, deleted or altered during the second period (1984-1987) than during the first period (1981-1984). An increase in budgetary allocation was found during each time period; however, the amount of increase during the first period was not comparable to the increased percentage of



student enrollment. Although slight changes were observed in the employment of full-time and part-time faculty within both time periods, a smaller percentage (8.3%) of part-time faculty were employed at the end of second time period (1984-1987) than was employed at the end of the first time period (1981-1984). Also, a greater percentage of nursing faculty with doctoral degrees were employed during the 1984-1987 time period than during the 1981-1984 period.

The third research question sought to determine the graduates' perceptions of the nursing program during two time periods. Although the results were not significant, the analysis indicated that Group A differed substantially from combined Groups B1 and B2 regarding categories on the questionnaire that dealt with faculty members and nursing courses. Perceptions concerning behavior during the NCLEX-RN administration were significantly different between Group B1 and Group B2 ( $p < .05$ ). Graduates in Group B1 tended to feel more comfortable and less anxious during the NCLEX-RN examination than those in Group B2.

Twelve "yes" or "no" questions requested answers to various individual situations experienced in the program by graduates in Groups A, B1, and B2. The most striking findings were that the majority of the graduates in each group participated in the NCLEX-RN review and they felt that the review enhanced their performance on the NCLEX-RN.

In response to strengths and weaknesses of the program, the most frequently cited strengths that were identified by two and on one strength by all groups were small class size, qualified faculty, and frequent testing. The two most frequent weaknesses reported by the three groups were limited clinical practice and too few assigned clients.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the study, conclusions, recommendations for further study, and a concluding summary of the chapter.

#### Summary of the Study

This study was conducted to identify variables which might explain differences in the performance of two groups of graduates in one moderate size state university baccalaureate nursing program during two time periods (1981-1984 and 1984-1987).

The investigator used two sources to collect data on 62 subjects. Information on academic and demographic variables was collected from the graduates' records which were located in the nursing office. Academic variables consisted of the admission criteria for admission to the nursing program: (1) SAT-V score, (2) GPA in prerequisite general education courses, (3) reading level, and (4) completion of general studies requirements. Four demographic variables were also examined and included (1) age, (2) marital status, (3) prior educational experience, and (4) the need to repeat a nursing course.

A second source of data was a 63-item questionnaire designed by the investigator. The questionnaire consisted of

three parts which related to the graduates' perceptions of individual situations of the nursing program. The first part was divided into eight categories and required responses using a Likert Scale rating. The eight categories were concerned with perceptions about the program's curriculum, educational experiences, program resources, faculty members' competence, support from fellow classmates, nursing program preparation for the NCLEX-RN, and graduates' behavior during the NCLEX-RN administration. The second part contained twelve "yes" or "no" questions. These questions related to work experience, NCLEX-RN experience, family responsibilities, and personal problems encountered. The final part consisted of three open-ended questions and requested identification of strengths and weaknesses of the program.

Questionnaires were mailed to 58 of the 62 subjects for whom current addresses were available. Thirty-eight questionnaires were returned for a return rate of 64 percent.

The statistical techniques used to analyze the data were t-tests for independent samples, frequency distributions, and content analysis. Subjects were divided into three groups to investigate the research questions. Group A consisted of 28 graduates who were successful on the NCLEX-RN at their first attempt during the first time period (1981-1984). Group B1 included 28 graduates who had successful scores on the NCLEX-RN at their first attempt during the second time period (1984-1987). Group B2 contained 6 graduates who were unsuccessful

on the NCLEX-RN at their first attempt during the second time period (1984-1987).

The first research question asked: Were there differences in the initial characteristics of students enrolled during the 1981-1984 period and those enrolled during the 1984-1987 period? To answer this question, data on the admission criteria and demographic variables were analyzed. The findings revealed a significant difference in the completion of general studies requirements ( $p < .05$ ) between the successful graduates in the first time period and the unsuccessful graduates in the second time period with the greater completion rate among the successful graduates (Table 2). Several trends related to the admission criteria emerged for the two periods. A trend during the first period was toward a substantially higher reading level ( $p < .053$ ) for successful graduates than for unsuccessful graduates in the second period. Also, the mean SAT-V and SAT-M scores were higher for successful graduates in the second period than for successful graduates in the first period, although the SAT-M was not one of the admission criteria. Additionally, a pattern emerged that showed the mean prenursing GPA to be slightly lower for successful graduates in the first period than for unsuccessful graduates in the second period.

Based on the analysis of data, it was concluded that successful graduates in the first period (1981-1984) differed significantly from the unsuccessful graduates in the second

period on one of the admission criteria (completion of general studies requirements favoring graduates in the first period). The trend in the first period was toward lower mean SAT-V and SAT-M scores for successful graduates than for successful graduates in the second period, and a slightly lower mean prenursing GPA for successful graduates than for unsuccessful graduates in the second period. Another trend was that successful graduates during the first period had a substantially higher mean reading level than did the unsuccessful graduates in the second period.

The unsuccessful graduates in the second period tended to meet all prenursing admission criteria. Overall, the profile of these graduates show that they maintained prenursing GPA's ranging from 2.7 to 3.4, had reading levels of 11.1 or higher, had SAT-M scores of 400 or lower, and SAT-V scores of 460 or lower. NCLEX-RN scores for the unsuccessful graduates ranged from 1369 to 1593, less than the minimum 1600 passing score.

From the analysis of the demographic data, it was found that no significant differences existed between the two time periods. However, the trends were toward a greater need for successful graduates in the first period to repeat nursing courses than for successful graduates in the second period and toward the completion of more college courses for successful graduates in the first period than for unsuccessful graduates in the second period.

The second research question asked: Were there differences in the nursing program offered between the 1981-1984 period and the 1984-1987 period? To answer this question, data were analyzed regarding the number of full-time and part-time faculty, faculty credentials, new faculty, faculty turnover, faculty/student ratios, curriculum and course revisions, and budgetary allocations.

Analysis of the data showed that the greatest differences between the two time periods were the following: (1) the percentage of fulltime faculty increased in the second time period from a range of 76.9 percent to 91.7 percent when compared to a decrease in a range from 100 percent to 83.3 percent for the first period, (2) the hiring of more part-time faculty occurred in the second period with a range of 8.3 percent to 23.1 percent compared to the first period with a range of 0.0 percent to 16.7 percent), (3) an increase in the number of doctoral prepared faculty in the second period from 15.4 percent to 25 percent compared to an increase of 0.0 percent to 8.3 percent in the first period, (4) a substantial percentage of faculty turnover in the first period (a range from 16.7 percent to 27.3 percent) as well as in the second period (a range from 15.4 percent to 25 percent), (5) minor revisions of courses were made in the second period (a two semester hour increase in the lower division of the first period and in the lower division of the second period, and five relatively minor course revisions in the second period).

The mean faculty/student ratios were the same for both time periods. Budgetary allocations showed an increase in both time periods, however, a slightly higher increase occurred in the second period although there was a 36 percent less student increase than in the first period which had a 48 percent student increase.

Thus, it was concluded that more program changes occurred during the second time period as measured by the employment of fewer full-time faculty, more part-time faculty, more faculty with the doctorate degree, and minor changes in curriculum and course revisions.

The third research question asked: Were there differences in the perception of the nursing program of those graduates enrolled during the 1981-1984 period and the 1984-1987 period? To answer this question, responses from the 63-item questionnaire were analyzed using t-tests, frequency distributions, and content analysis. Comparisons were made between Group A (successful graduates,  $n = 15$ ) in the first period, and combined Groups B1 (successful graduates,  $n = 18$ ), and B2 (unsuccessful graduates,  $n = 5$ ) in the second period.

From the analysis of data, no significant differences existed between the graduates' perceptions of the nursing program during the first period and graduates' perceptions during the second period regarding the eight categories of the questionnaire. The section of the questionnaire which comprised these eight categories included perceptions about:



(1) program's curriculum, (2) educational activities, (3) faculty members' competence, (4) nursing courses, (5) fellow classmates' support, (6) program resources, (7) nursing program's preparation for the NCLEX-RN, and (8) behavior during the NCLEX-RN. There were several trends that emerged from the analysis. Two trends were that more graduates during the first period tended to be considerably impressed with faculty members' competence and with the benefits of the nursing courses than graduates during the second period. Although the graduates did not differ significantly during the two time periods in their perceptions about the nursing program, a significant difference emerged between the successful and unsuccessful graduates during the second period concerning behavior during the NCLEX-RN administration. The data revealed that Group B1 felt significantly more comfortable and less anxious than did Group B2 ( $p < .05$ ). Also from the data, it was concluded that during the first period, graduates rated the faculty members' competence considerably higher than did those graduates in the second period. Additionally, graduates in the first period felt that the nursing courses provided more benefits than the graduates in the second period.

The second part of the questionnaire requested "yes" or "no" responses to twelve questions related to work experience, NCLEX-RN experience, family responsibilities, and personal problems. The data showed the following differences in the

perceptions of graduates during the two time periods: (1) graduates in the first time period reported a larger percentage than graduates in the second time period for these questions -- a. review enhanced NCLEX-RN performance, Group A (67 percent), Group B1 (61 percent), Group B2 (60 percent); b. work made studying difficult, Group A (47 percent), Group B1 (39 percent), Group B2 (40 percent); c. work enhanced knowledge, Group A (73 percent), Group B1 (67 percent), Group B2 (40 percent); (2) successful and/or unsuccessful graduates in the second time period reported larger percentages than graduates in the first time period for these questions -- a. participated in NCLEX-RN review, Group B1 (83 percent), Group A (73 percent), Group B2 (60 percent); b. finished the NCLEX-RN, Group B2 (100 percent), Group B1 (83 percent), Group A (67 percent); c. was confident in being ready to take the NCLEX-RN, Group B1 (94 percent), Group A (87 percent), Group B2 (40 percent); d. employed while enrolled, Group B1 (83 percent), Group A (80 percent), Group B2 (40 percent); e. worked in health care agency, Group B1 (78 percent), Group A (73 percent), Group B2 (40 percent); f. had major family responsibilities while enrolled, Group B1 (56 percent), Group A (47 percent), Group B2 (40 percent); g. family responsibilities made studying difficult, Group B2 (40 percent), Group B1 (39 percent), Group A (33 percent); and h. experienced personal problems, Group B2 (60 percent), Group B1 (39 percent), Group A 27 percent).

The third part of the questionnaire involved identification of strengths and weaknesses of the program. Analysis of data revealed that the most frequently identified strengths cited by the successful graduates in the first period were small class size, qualified faculty, frequent testing, individualized attention, and updated resources. These were also the most frequently cited strengths by graduates in the second time period. Graduates from both time periods noted the two most frequent weaknesses as limited clinical practice and too few assigned clients. From the data, it was concluded that graduates from both time periods identified similar strengths and weaknesses of the nursing program.

#### Conclusions

Successful graduates in the first period (1981-1984) in one moderate size state university nursing program differed significantly on one of the admission criteria from unsuccessful graduates in the second period (1984-1987). Graduates from the first time period had a better general studies completion rate than did the unsuccessful graduates in the second time period. From this data, it is evident that students who complete general studies requirements prior to admission to the nursing major tend to be more successful in terms of performance on the NCLEX-RN than those who do not. This finding is consistent with that of Porter (1984) who examined curriculum components in a baccalaureate program and

found that the biological science courses (anatomy, physiology, microbiology, and chemistry) act as predictors of a successful pass rate on the licensure examination.

In North Carolina, nursing programs at state supported baccalaureate granting universities (especially predominately black and also predominately white) are under considerable pressure to increase enrollment, to increase the pass rate on the licensure examination, and to decrease costs. However, one of the findings of this study suggests that admitting students who have not completed all general studies requirements for the nursing program might increase enrollment, but might also jeopardize the licensure pass rate. Thus, nursing programs should scrutinize more carefully the prenursing background of its prospective majors prior to admission with a view toward admitting only those students who have met all admission requirements. The findings support the view that traditional academic variables (SAT-V score, reading level, and prenursing GPA) do not differentiate between the successful graduates of the first period (1981-1984) and unsuccessful graduates of the second period (1984-1987) in terms of the performance on the NCLEX-RN. Additionally, the findings indicated that traditional demographic variables (age, marital status, prior educational experience, and the need to repeat nursing courses) did not differ significantly between the successful graduates in the first period and the successful and unsuccessful graduates in the second period regarding their

performance on the NCLEX-RN. Concerning these academic and demographic variables, the means for the successful graduates of the first period and the unsuccessful graduates of the second period were similar.

The findings of this study are consistent with those of Lyons (1985), and Forman and Owen (1990). Lyons found no relationship between college GPA and success on the licensure examination. Forman and Owen found that the SAT-V score was not related to success on the NCLEX-RN. However, studies by Payne and Duffey (1986) and Ferguson (1987) were inconsistent with the findings of the current study regarding the SAT-V score and the college GPA. These researchers found these variables to be good predictors of NCLEX-RN performance.

These mixed results imply that other variables which might not have been previously examined (such as motivation, self-esteem, and support systems) might more fully explain differences between successful and unsuccessful graduates' performance on the NCLEX-RN, or it might be the case that other factors students encountered in the program (such as individualized attention) might more fully explain differences in performances.

Although the SAT-M score was not one of the admission criteria, analysis of SAT-M data was conducted. The findings revealed that successful graduates in the first period (1981-1984) had a significantly higher mean SAT-M score than did the unsuccessful graduates in the second period (1984-1987). Also,

the successful graduates' mean SAT-M score in the first period was lower than that of successful graduates in the second period. The findings of the SAT-M score in this study correlate with the findings of Schoenfisch (1983) who determined that the mean SAT-M of baccalaureate graduates who passed the licensure examination were significantly higher than that of those who failed the examination. Consequently, in view of these findings, nursing programs might want to consider the use of the SAT-M score as one of the criteria for admission to the nursing major and/or as a means of identifying students who might benefit from enhancement and support activities to pass the nursing licensure examination.

In fact the finding of this study showed that unsuccessful graduates tended to share some similar characteristics. Although they met all prenursing admission requirements, they had SAT-V scores of 460 or lower and SAT-M scores of 400 or lower. Despite their prenursing GPAs (2.7 to 3.4) and reading levels (11.1 to 12.9), these graduates scored 7 to 231 points below the minimum passing score of 1600 on the NCLEX-RN. Indeed, additional enhancement and support activities might have resulted in successful performance on the NCLEX-RN for these graduates.

The findings on program changes indicated that the majority of the changes occurred in the second period (1984-1987) rather than in the first period (1981-1984). Nevertheless, the increase in full-time faculty, the decrease

in part-time faculty, the increase in more academically qualified faculty, and the increase in the budgetary allocation did not result in the successful performance of all nursing graduates on the NCLEX-RN in the second period. Perhaps the timing of part-time faculty hiring might have adversely affected the graduates' success rate on the licensure examination. On the one hand, part-time faculty employment was high at the same time that graduates in the second period were first admitted to the nursing major, and on the other hand the program was undergoing a relatively high percentage of faculty turnover. Additionally, the responsibilities and roles assigned to doctoral prepared faculty might have diminished their instructional involvement and effectiveness with students. This finding concerning doctoral prepared faculty concurs with that of Zanecchia (1981) who found that doctoral prepared faculty contributed little to the nursing graduates' success on the licensure examination. The relationship of doctoral prepared faculty to nursing graduates' pass rate on the NCLEX-RN may well need to be investigated. Further, based on the findings of the current study, many changes in similar baccalaureate nursing programs might create a negative impact upon the successful performance of graduates on the NCLEX-RN

Perceptions of graduates revealed no significant differences between the two time periods regarding the program's curriculum, educational experience, faculty members'

competence, nursing courses, support from fellow classmates, program resources, program's preparation for the NCLEX-RN, and behavior during the NCLEX-RN examination. However, one trend which emerged was toward successful graduates in the first period (1981-1984) feeling that faculty members were more competent than successful and unsuccessful graduates in the second period (1984-1987). A second trend was that successful graduates in the first period viewed the nursing courses as more beneficial than the graduates in the second period. These two trends suggest that a greater stability in the faculty and in the curriculum existed in the first period than in the second period.

Successful graduates in the second period tended to be affected in a positive way by work experience, NCLEX-RN review, and family responsibilities. Unsuccessful graduates in the second period appeared to have no difficulty in finishing the NCLEX-RN, but tended to be adversely affected by personal problems encountered. Successful graduates in the first period tended to believe that the review enhanced their performance on the NCLEX-RN and that part-time work in the health field enhanced their knowledge base. From these findings, it is concluded that the perceptions of graduates about the nursing program might serve as a data base for improvements that might affect the graduates' success in the program. Additionally, strengths and weaknesses were identified by graduates in both time periods. However, the



small number of responses to this requested information from graduates in both time periods precludes any definitive conclusions. Nevertheless, the finding that clinical experience enhanced performance on the NCLEX-RN seemingly warrants further attention because of its direct relation to the profession.

#### Recommendations

Based on the findings and the conclusions, the following recommendations are made for the nursing program of the institution in this study:

1. The nursing program administrators should consider using the SAT-M score to assess students' potential for success in the program and their performance on the NCLEX-RN.
2. The nursing program administrator should reevaluate their admission criteria with a view toward re-examining the role of the SAT-V and the prenursing GPA considering the fact that these variables do not discriminate between successful and unsuccessful performance on the NCLEX-RN.
3. Greater attention should be placed on the completion of general studies requirements prior to admission to the nursing major.
4. Nursing faculty and program administrators might consider providing enhancement and support activities

for those students who score 460 or less on the SAT-V and 400 or less on the SAT-M.

5. The program administrators should strive to increase faculty stability in terms of maintaining a strong full-time instructional faculty.
6. The study should be replicated to analyze data generated by other graduates of the nursing program and to validate the findings of this study.

#### Recommendations for Future Research

To expand the findings of this study, the following recommendations for further research are made:

1. Future researchers should investigate the relationship of additional variables such as the amount of time and performance in the clinical area on students' performance on the nursing licensure examination.
2. The study should be replicated in similar baccalaureate programs to validate the findings and to generalize the findings to a larger population.

#### Summary of Chapter

The purpose of the study was to identify possible factors that related to changes in the performance on the NCLEX-RN in a moderate size state university baccalaureate nursing program during two time periods (1981-1984 and 1984-1987).

Three research questions were formulated which asked the following questions: (1) Were there differences in the characteristics, at the time of their admission to the nursing

major, between the students enrolled during the 1981-1984 period and those enrolled during the 1984-1987 period? (2) Were there differences in the nursing program offered between the 1981-1984 period and the 1984-1987 period? (3) Were there differences in the students' perceptions of the nursing program of those enrolled during the 1981-1984 period and those enrolled during the 1984-1987 period?

Students' records and a 63-item questionnaire provided the data sources for this study. Thirty-eight of the 58 questionnaires were returned for a 64 percent return rate. The data were analyzed by using t-tests, frequency distributions, and content analysis.

The findings revealed that, overall, no significant differences existed between the two time periods based on admission criteria and demographic variables. There was, however, a significantly higher rate of completion of general studies requirements among the successful graduates in the first period (1981-1984) than for unsuccessful graduates in the second period. In examining data on program changes, major findings revealed that fewer part-time faculty, more doctoral prepared faculty and more full-time faculty were employed in the second period when there was a decline in graduates' performance on the NCLEX-RN. Second period graduates' perceptions of individual situations of the program were significantly different between successful and unsuccessful

graduates regarding their behavior during the NCLEX-RN administration with successful graduates feeling calmer.

Major strengths identified by successful graduates of both time periods included small class size, qualified faculty, and frequent testing. Major weaknesses cited by both groups were limited clinical practice, and too few assigned clients.

Based on the conclusions of this study, the investigator made the following recommendations:

1. The nursing program administrators should consider using the SAT-M score to assess students' potential for success in the program and their performance on the NCLEX-RN.
2. The nursing program administrators should re-evaluate their admission criteria with a view toward re-examining the role of the SAT-V and the prenursing GPA considering the fact that these variables do not discriminate between successful and unsuccessful performance on the NCLEX-RN.
3. Greater attention should be placed on the completion of general studies requirements prior to admission to the nursing major.
4. The program administrators should strive to increase faculty stability in terms of maintaining a strong full-time instructional faculty.

5. The study should be replicated to analyze data generated by other graduates of the nursing program and to validate the findings of this study.

## BIBLIOGRAPHY

- Addison, C. E. (1986). Factors associated with educational success of black inner city nursing students. Unpublished doctoral dissertation, Wayne State University, Detroit Michigan.
- Aldag, J., & Rose, S. (1983). Relationship of age, American College Testing scores, grade point average, and state board examinations scores. Research in Nursing and Health, 6, 69-73.
- Alexander, J.W. (1979). How the public perceives nurses and their education. Nursing Outlook, 27, 654-656.
- Allen, C. B., Higgs, Z.R., & Holloway, J. (1988). Identifying students at risk for academic difficult. Journal of Professional Nursing, 4(2), 113-118.
- Baldwin, D. M. (1987). A correlational study of self-concept, learning style, college GPA, and SAT math and verbal scores with academic performance and success rate for black graduates from traditional black institution on the national council licensure examination for registered nurses. Unpublished doctoral dissertation, Georgia State University, Atlanta, Georgia.
- Bell, J., & Martindill, C. F. (1976). A cross-validation study for predictors of scores on state board examination, Nursing Research, 25(1), 54-57.
- Bevis, E. O. (1989). Curriculum building in nursing (3rd ed.). Publication No. 15-2277. New York: NLN.
- Blaney, D. R. (1986). An historical review of positions in baccalaureate education in nursing as basic preparation for professional nursing practice 1960-1884. Journal of Nursing Education, 25(5), 182-185.
- Boyle, K. (1986). Predicting the success of minority students in a baccalaureate nursing program. Journal of Nursing Education, 25(5), 186-191.
- Breyer, F. J. (1984). The comprehensive nursing achievement test as a predictor of performance on the NCLEX-RN, Nursing and Health Care, 5(4), 193-195.

- Brown, M.L. (1987). The effects of a support group on student attrition due to academic failure. Journal of Nursing Education, 26(8), 324-327.
- Burgess, M., Duffey, M., & Temple, F. (1972). Two studies of prediction of success in a collegiate program of nursing. Nursing Research, 21(4), 357-366.
- Campbell, A.L., & Davis, S. M. (1990). Enrichment for academic success: Helping at-risk students. Nurse Educator, 15(6), 33-37.
- Cloud-Hardaway, S. A. (1988). Relationship among "Mosby's Assess Test" scores, academic performance, and demographic factors and associate degree nursing graduates' NCLEX scores. (Doctoral Dissertation, University of North Texas, 1989). Dissertation Abstracts International, 49, 2567B.
- Coetsee, M. (1979). The prediction of academic success in baccalaureate nursing students. (Doctoral Dissertation, The University of Alabama in Birmingham, 1980), Dissertation Abstracts International, 41, 2120B.
- Coleman, E. (1986). On redefining the baccalaureate degree. Nursing and Health Care, 7(4), 193-196.
- Dell, M. A., Halpin, G. (1984). Predictors of success in nursing school and on state board examination in a predominately black baccalaureate nursing program. Journal of Nursing Education, 23(4), 147-150.
- Esry, C. M. (1987). An analysis of the relationship of selected variables to national council licensing examination performance of the graduates in a midwestern university school of nursing. (Doctoral Dissertation, University of Kansas, 1988). Dissertation Abstracts International, 48, 2924B.
- Felts, J. (1986). Performance predictors for nursing courses and NCLEX-RN. Journal of Nursing Education, 25(9), 372-377.
- Felts, M. J. (1985). Predictors of national council licensure examination performance of graduates in unilevel associate degree nursing programs in Kansas, 1985). Dissertation Abstracts International, 46, 793A.

- Ferguson, H. W. (1987). Predicting successful completion of bachelor of science in nursing degree and successful performance on the national council licensing examination from preadmission variables, Unpublished doctoral dissertation, Columbia University Teachers College, New York, N. Y.
- Forman, R. D., & Owen, S. V. (1989). Predicting performance on the national council licensure examination. Western Journal of Nursing Research, 11(3), 334-347.
- Fotos, B. J. (1985). The relationship of nursing students' perceptions of college organizational climate and their achievement on the national council licensing examination for registered nurses. (Doctoral Dissertation, West Virginia University, 1986). Dissertation Abstracts International, 47, 993B.
- Gay, L. R. (1981). Educational Research (2nd ed.). Columbus, Ohio: Charles E. Merrill Publishing Co.
- Grant, R. E. (1986). Predicting academic success. In Holzemer, W. C. (Ed.), Review of Research in Nursing. Publication, No. 15-2170, New York: NLN
- Hagen, E. (1979). A judgment of merit-evaluation of programs in nursing methodology, Publication No 16-1765, New York: NLN
- Hayes, E. (1981). Prediction of academic success in a baccalaureate nursing education program, Journal of Nursing Education, 20(6), 4-8.
- Heupel, C. C. (1986). Selection Policy for nursing licensure. (Doctoral Dissertation, University of Minnesota, 1987). Dissertation Abstracts International, 47, 4253A.
- Hilbert, G.A., & Allen, L.R. (1985). The effect of social support on educational outcomes. Journal of Nursing Education, 24(2), 48-51.
- Holeman, D. M. (1986). Self-efficacy, achieving tendency, locus of control and coping styles as predictors of academic performance of nursing students enrolled in baccalaureate and associate degree nursing programs. (Doctoral Dissertation, Georgia State University, 1987). Dissertation Abstracts International, 47, 2837B.
- Kelly, L. Y. (1980). A question of competency. Nursing Outlook, 28(2). p. 138.



- Kissinger, J. F., & Munjas, B. A. (1982). Predictors of student success. Nursing Outlook, 30(1), 53-54.
- Kruger, D. E. (1980). Limited variables compared with success/failure of associate degree graduates who were first time writers of the state board test pool examinations. (Doctoral Dissertation, Oklahoma State University, 1980). Dissertation Abstracts International, 41, 3436A.
- Krupa, K., Quick, M., & Whitley, T. (1988). The effectiveness of nursing grades in predicting performance on the NCLEX-RN. Journal of Professional Nursing, 4(4), 294-297.
- Kramer, M. (1981). Philosophical foundations of baccalaureate nursing education. Nursing Outlook, 29, 224-228.
- Lambert, C.W. (1986). A study of predictors of performance on the national council's licensure exam for Registered Nurses. (Doctoral Dissertation, University of Arkansas, 1986). Dissertation Abstracts International, 47, 1623A.
- Lee, L. A. (1986). Pre-nursing cognitive and non-cognitive variables as predictors of performance on state board test pool examinations for registered nurses. (Doctoral Dissertation, Texas Tech University 1980). Dissertation Abstracts International, 41, 1429A.
- Lessner, M. W. (1985). Selected correlates of student outcomes of integrated and non-integrated content baccalaureate nursing programs in public research universities. (Doctoral Dissertation, The University of Connecticut, 1986). Dissertation Abstracts International, 47, 133B.
- Lyons, D. M. (1985). An evaluative study of academically high risk students in a baccalaureate nursing program, Unpublished doctoral dissertation. The University of Alabama.
- Mattassarini-Jacobs, E. (1989). The nursing licensure process and the NCLEX-RN. Nurse Educator, 14(6), 32-35.
- Melcolm, N., & Bausell, R. B. (1981). The prediction of state board test pool examinations scores within an integrated curriculum. Journal of Nursing Education, 20(5), 24-28.

- McKinney, J. A. (1989). An investigation of academic correlates of baccalaureate graduates' performance on the national council licensure examination for registered nurses. (Doctoral Dissertation, West Virginia University, 1990). Dissertation Abstracts International, 51, 1195B.
- McKinney, J., Small, S., O'Dell, N., & Coonrod, B. (1988). Identification of predictors of success for the NCLEX and students at risk of NCLEX failure in a baccalaureate nursing program. Journal of Professional Nursing, 4(1). 55-59.
- McNally, J. M. (1979). Improvement of licensure results of minority bachelor of science nursing students. Journal of Nursing Education, 18(6), 8-18.
- Mix, J. A. (1983). Predictors of success on state board examinations for associate degree nursing graduates, Unpublished doctoral dissertation, University of Cincinnati.
- Moore, J. F. (1989). An investigation of multiple variables to measure success in a baccalaureate nursing program. (Doctoral Dissertation, University of Wyoming, 1990). Dissertation Abstracts International, 51, 458A.
- Muhlenkamp, A.F. (1971). Let's examine-Prediction of state board scores in a baccalaureate program. Nursing Outlook, 19(1), p. 57.
- National Council of State Boards of Nursing. (1988). NCLEX: Keeping pace with practice. (1988). Issues, 9(3), 3-6.
- National Council of State Boards of Nursing. (1988). NCLEX: Keeping pace with practice, (1988). Issues, 9(4). 3-6.
- National League for Nursing. (1983). Position statement on nursing roles-scopes and preparation. Publication No. 11-1893. New York: National League for Nursing
- North Carolina Board of Nursing. (1988). Approval of nursing programs: process and standards. Raleigh, N. C.: North Carolina Board of Nursing.
- Norton, J. M. (1985). An exploration of selected noncognitive variables as predictors of success in basic nursing education programs. (Doctoral Dissertation, Virginia Polytechnic Institute and State University, 1986). Dissertation Abstracts International, 47, 135B.

- Outtz, J. (1979). Predicting the success on state board examination for blacks. Journal of Nursing Education, 18(9), 35-40.
- Payne, M. A., & Duffey, M. A. (1986). An investigation of the predictability of NCLEX scores of BSN graduates using academic predictors. Journal of Professional Nursing, 2(5), 326-332.
- Perez, T. L. (1977). Investigation of academic moderator variables to predict success on state board of nursing examinations in a baccalaureate program. Journal of Nursing Education, 16(8), 16-23.
- Philbrick, M. (1988). Number of RN examinees and pass rates both down in 1987. Tar Hill Nurse, 50(1), p. 9.
- Phillips I. M. (1987). Test anxiety and the performance of graduate nurses on the national council licensure examination for registered nurses. (Doctoral Dissertation, Texas Southern University, 1989). Dissertation Abstracts International, 49, 2570B.
- Porter, B. M. (1984). The relationship of specific components of baccalaureate nursing curriculum, entrance requirements, attrition rates, and passage rates of programs on State Board Examinations. Unpublished doctoral dissertation, The University of Kentucky.
- Poteet, G., & Pollok, C. (1986). Increasing accountability through program evaluation. Nurse Educator, 11(2), 41-47.
- Quick, M., Krupa, K. & Whitley T. (1985). Using admission data to predict success on the NCLEX-RN in a baccalaureate program. Journal of Professional Nursing, 1(6), 364-367.
- Quiring, J., & Gray, G.T. (1979). Is baccalaureate education based on a patchwork curriculum? Nursing Outlook, 27, 708-713.
- Rosenfeld, P. (1986). Nursing and professionalism: On the road to recovery. Nursing and Health Care, 7(9), 415-488.
- Schoenfisch, S. A. (1983). Predictors of Florida baccalaureate nursing graduates success on the national council licensure examination. Unpublished doctoral dissertation, The Florida State University.

- Schwirian, P. (1976a). Prediction of successful nursing performance: Part I: A review of research related to the prediction of successful nursing performance, 1965-1976. (DHEW Publication No. HRA 77-27). Washington, DC: Government Printing Office.
- Schwirian, P. (1976b). Prediction of successful nursing performance: Part II: Admission practices, evaluation strategies, and performance prediction among schools of nursing. (DHEW Publication No. HRA 77-27). Washington, DC: Government Printing Office
- Schwirian, P., & Gortner, S. R. (1979). How nursing schools predict their successful graduates. Nursing Outlook, 27, 352-358.
- Sharp, T. G. (1984). An analysis of the relationship of seven selected variables to state board test pool examination of the University of Tennessee. Journal of Nursing Education, 23(2), 57-63.
- Seither, F. F. (1980). Prediction of achievement in baccalaureate nursing education. Journal of Nursing Education, 19(28-36).
- Shepard, P. A. (1990). The use of part-time faculty in associate degree nursing, social science, and biological science programs. (Doctoral Dissertation, University of North Texas, 1981). Dissertation Abstracts International, 51, 2966A.
- Sisca, J. R. (1984). Passing the state board examination. Journal of Nursing Education, 23(8), 358-361.
- Spainer, A. (1988). The development process of NCLEX-RN and NCLEX-RN item pools, Issues. 9(2), 2-8.
- SPSS, Inc. (1990). SPSSX User's Guide. Chicago: McGraw-Hill.
- Stevens, B. J. (1986). Does the 1985 nursing education proposal make economic sense? Nursing Outlook, 33(3), 124-127.
- Stewart, J., & Hluchyj, T. (1987). An approach to nursing curriculum evaluation. Nursing Outlook, 35,(2), 79-81.
- Stronck, D.R. (1979). Predicting student performance from college admission criteria. Nursing Outlook, 27,(9), 604-607.

- Styles, M. M., & Holzemer, W. L. (1986). Educational remapping for a responsible future. Journal of Professional Nursing, 2(1), 64-67.
- Test plan for registered nurse state board test pool examination, (1980). National Council of State Board of Nursing, Inc. Chicago, Illinois, 1-5.
- Thompson, P. E. (1982). The identification of selected student factors, prior to admission into the nursing sequence, in successful completion of a baccalaureate nursing education. (Doctoral Dissertation. North Texas State University, 1982). Dissertation Abstracts International, 43, 681A.
- Todd, O. M. (1986). Selected factors associated with academic success of black and white students in urban associate degree nursing programs. (Doctoral Dissertation, The University of Michigan, 1987). Dissertation Abstracts International, 47, 3681.
- Vaughn, J. C. (1982). Educational preparation for nursing 1981. Nursing and Health Care, 3(8), 447-455.
- Waltz, C. F., & McGurn, W. C. (1983). An approach to the assessment of programs in nursing education. Nursing and Health Care, 4(10), 576-582.
- Whitley, M. P., & Chadwick, P. (1986). Baccalaureate educational and NCLEX: The causes of success. Journal of Nursing Education, 25(3), 94-101.
- Woodham, R., & Taube, K. (1986). Relationship of nursing program predictors and success on the NCLEX-RN examination for licensure in a selected associated degree program. Journal of Nursing Education, 25(3), 112-117.
- Yang, J. C., Glick, O. J., & McClelland, E. (1987). Academic correlates of baccalaureate graduate performance on NCLEX-RN. Journal of Professional Nursing, 298-305.
- Yocum, C. J., & Scherubel, J. (1985). Selected pre-admission and academic correlates of success on state board Examinations, Journal of Nursing Education, 24(6), 244-249.
- Zanecchia, M. D. (1981). A study of the relationships of nursing faculty attributes, faculty productivity, nursing student attributes and selected student outcomes. Unpublished doctoral dissertation, The University of Connecticut.

APPENDIX A  
QUESTIONNAIRE OF GRADUATES' PERCEPTIONS  
OF NURSING PROGRAM

# SURVEY OF SELECTED NURSING GRADUATES

The following 63 statements refer to possible strengths and weaknesses of the nursing program at Winston-Salem State University (WSSU). Please indicate your perceptions about the WSSU nursing program through your first NCLEX-RN experience.

Respond to items 1 to 48 by circling your response in the space provided.

|   | Strongly<br>Agree | Agree | Uncertain | Disagree | Strongly<br>Disagree |
|---|-------------------|-------|-----------|----------|----------------------|
| <b>I. The nursing program curriculum:</b>   |                   |       |           |          |                      |
| 1. Amount of time spent in skills laboratory was adequate to practice the application of theory | SA                | A     | U         | D        | SD                   |
| 2. Amount of time spent in the Learning Resources Center was adequate to supplement learning    | SA                | A     | U         | D        | SD                   |
| 3. Amount of time spent in the clinical agencies was adequate for the application of theory     | SA                | A     | U         | D        | SD                   |
| 4. Clinical experience provided adequate opportunity to apply theoretical concepts              | SA                | A     | U         | D        | SD                   |

II. Supplementary activities  
as related to nursing  
program: I

|   |    |   |   |   |    |
|---|----|---|---|---|----|
| 5. Had regular study time   | SA | A | U | D | SD |
| 6. Found it difficult to concentrate while studying               | SA | A | U | D | SD |
| 7. Was unable to complete assignments on my own                   | SA | A | U | D | SD |
| 8. Turned in late assignments                                     | SA | A | U | D | SD |
| 9. Turned in incomplete assignments                               | SA | A | U | D | SD |
| 10. Recognized the need for academic assistance                   | SA | A | U | D | SD |
| 11. Failed to seek assistance for academic weaknesses             | SA | A | U | D | SD |
| 12. Spent at least two hours per class period preparing for class | SA | A | U | D | SD |
| 13. Studied with another person or group                          | SA | A | U | D | SD |

III. The nursing program  
faculty: Faculty  
members

|  |    |   |   |   |    |
|--|----|---|---|---|----|
| 14. Were knowledgeable in their specialty area | SA | A | U | D | SD |
| 15. Overall, were prepared for class           | SA | A | U | D | SD |



|  |    |   |   |   |    |
|--|----|---|---|---|----|
| 16. Used a variety of<br>of teaching methods<br>to present content       | SA | A | U | D | SD |
| 17. Kept abreast of<br>current trends in<br>their specialty              | SA | A | U | D | SD |
| 18. Served as role<br>models   | SA | A | U | D | SD |
| 19. Overall, encouraged<br>independent<br>thinking                       | SA | A | U | D | SD |
| 20. Provided feedback<br>that was valuable<br>for continuing<br>learning | SA | A | U | D | SD |
| 21. Validated students'<br>ongoing progress                              | SA | A | U | D | SD |
| 22. Provided timely<br>feedback to promote<br>learning                   | SA | A | U | D | SD |
| IV. The nursing program<br>courses: Courses                              |    |   |   |   |    |
| 23. Were organized in<br>a logical fashion                               | SA | A | U | D | SD |
| 24. Progressed from<br>simple to complex<br>content                      | SA | A | U | D | SD |
| 25. Included content<br>that was relevant<br>to future needs             | SA | A | U | D | SD |
| 26. Included content<br>that stimulated<br>students to think             | SA | A | U | D | SD |
| 27. Included content<br>derived from a<br>variety of sources             | SA | A | U | D | SD |
| 28. Measured attainment<br>of objectives<br>through evaluation           | SA | A | U | D | SD |

V. Fellow students in the  
nursing program:  
Classmates

|   |    |   |   |   |    |
|---|----|---|---|---|----|
| 29. Participated in<br>class activities                                   | SA | A | U | D | SD |
| 30. Were supportive<br>of each other                                      | SA | A | U | D | SD |
| 31. Demonstrated<br>concern for the<br>academic progress<br>of each other | SA | A | U | D | SD |
| 32. Showed concern for<br>the general well<br>being of each other         | SA | A | U | D | SD |
| 33. Demonstrated a<br>sense of belonging                                  | SA | A | U | D | SD |
| 34. Shared ideas to<br>promote cohesiveness<br>of the group               | SA | A | U | D | SD |

VI. The nursing program  
facilities: Learning  
resources

|  |    |   |   |   |    |
|--|----|---|---|---|----|
| 35. Were accessible                                    | SA | A | U | D | SD |
| 36. Included current<br>information                    | SA | A | U | D | SD |
| 37. Included media<br>materials to<br>support learning | SA | A | U | D | SD |
| 38. Were maintained in<br>in working<br>condition      | SA | A | U | D | SD |
| 39. Included quality<br>media materials                | SA | A | U | D | SD |

VII. The nursing program  
as it relates to  
the NCLEX-RN:

- |   |    |   |   |   |    |
|---|----|---|---|---|----|
| 40. Content covered<br>in the curriculum<br>was similar to<br>content on the<br>NCLEX-RN  | SA | A | U | D | SD |
| 41. Class examination<br>questions were<br>similar to NCLEX-RN<br>questions in terms<br>of the nursing<br>process (e.g., similar<br>assessment, planning,<br>implementation, and<br>evaluation questions<br>were asked)   | SA | A | U | D | SD |
| 42. Class examination<br>questions were<br>similar to NCLEX-RN<br>questions in terms<br>of locus of decision-<br>making (e.g., questions<br>related to which<br>decisions are made<br>by the nurse, nurse-<br>client, or client<br>were asked)                              | SA | A | U | D | SD |
| 43. Class examination<br>questions were<br>similar to NCLEX-RN<br>questions in terms<br>of human function<br>(e.g., similar<br>questions relating<br>to protective<br>function, elimination,<br>nutrition, psychosocial<br>function, and fluid-gas<br>transport were asked) | SA | A | U | D | SD |

VIII. Behavior during  
NCLEX-RN: I

|  |    |   |   |   |    |
|--|----|---|---|---|----|
| 44. Spent too much<br>time answering<br>some questions                     | SA | A | U | D | SD |
| 45. Was rushed to<br>finish the<br>examination                             | SA | A | U | D | SD |
| 46. Experienced<br>periods of mental<br>blocking during<br>the examination | SA | A | U | D | SD |
| 47. Was anxious<br>before<br>taking the<br>examination                     | SA | A | U | D | SD |
| 48. Was anxious<br>during the<br>examination                               | SA | A | U | D | SD |

CIRCLE YES OR NO FOR QUESTIONS 49 TO 61

49. Did you participate in a national NCLEX review?

Yes

No

50. If yes to question 49, did the NCLEX review enhance your performance on the examination? If no to question 49, skip 50 and go to question 51.

Yes

No

51. Did you finish each section of the NCLEX-RN?

Yes

No

52. Did you feel confident in being ready to take the examination?

Yes

No

53. Were you employed while enrolled in the nursing program?

Yes

No

54. If yes to question 53, did working make studying difficult? If no to question 53, skip 54, 55, 56, 57, and go to question 58.

Yes No

55. Did you work more than two to four days per week?

Yes No

56. Did you work in a health care agency?

Yes No

57. If yes to question 56, did your work experiences enhance your nursing knowledge? If no to question 56, skip 57 and go to question 58.

Yes No

58. Did you have major family responsibilities while enrolled in the nursing program? (e.g., care of children, spouse, or other significant others)

Yes No

59. If yes to question 58, did family responsibilities make studying difficult? If no to question 58, skip 59 and go to question 60.

Yes No

60. Did any personal problems/situations interfere with your nursing education?

Yes No

61. If yes to question 60, please describe below. If no to question 60, skip 61 and 62 and go to question 63.

| When (Circle)       | Describe Problem and/or Situation |
|---------------------|-----------------------------------|
| Fall, Junior Year   | _____                             |
|                     | _____                             |
|                     | _____                             |
| Spring, Junior Year | _____                             |
|                     | _____                             |
|                     | _____                             |

Summer

---

---

---

When (Circle)

Describe Problem and/or Situation

Fall, Senior Year

---

---

---

Spring, Senior Year

---

---

---

62. What, if anything, might the nursing faculty or program have done to assist you with your problem and / or situation?

63. Please list any other factors which you feel may be related to the strengths and weaknesses of the nursing program at Winston-Salem State University.

Strengths\_\_

Weaknesses\_\_

**APPENDIX B**  
**COVER LETTERS**





**Winston-Salem State University**  
WINSTON-SALEM, NORTH CAROLINA 27101

*Nursing Department*

May 27, 1988

Dear

I am a doctoral student at the University of North Carolina at Greensboro and a nursing faculty member at Winston-Salem State University (WSSU). The Chancellor has asked me to conduct an evaluation of the nursing program at WSSU, an evaluation which will also be the basis of my dissertation. The major purpose of the study is to determine how selected factors of the WSSU nursing program are related to the performance of graduates on the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

Specifically, I will seek to identify factors that influence performance on students' first attempts at the NCLEX-RN. You are being ask to participate in the study by responding to the enclosed questionnaire, which takes approximately 15-20 minutes to complete.

The results from the study will be used for ongoing evaluation of the program, and the findings will help strengthen and improve the nursing program. The data will be summarized, and a written report will be submitted to the Chancellor. No names will be used in the analysis of the data, which will insure participants' confidentiality.

I thank you for your cooperation.

Sincerely,

*Sadie B. Webster*

Sadie B. Webster, UNC-G Doctoral Candidate and  
Chairperson, Department of Nursing and Allied Health  
Winston-Salem State University

208 Dellabrook Road  
Winston-Salem, N.C. 27105  
April 15, 1988

Dr. Richard Bennett  
Vice Chancellor for Academic Affairs  
Winston-Salem State University  
Winston-Salem, N.C. 27110

Dear Dr. Bennett:

I am conducting a study of the nursing program at Winston-Salem State University at the request of the Chancellor. This study will also be used for my dissertation at the University of North Carolina at Greensboro. Selected variables of the program will be examined to determine their relationship to the performance of our graduates' first attempt at the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

Your permission is requested for use of the records of nursing graduates between 1982-1987. I will collect the following data from the record: preadmission cumulative GPA, SAT scores, reading level, general studies requirements completed, grades in nursing courses, and NCLEX-RN scores. No names will be used in the analysis of data, thereby insuring participants' confidentiality.

I thank you for your consideration of this request.

Sincerely,

*Sadie B. Webster*

Sadie B. Webster, UNC-G Doctoral  
Candidate and Chairperson  
Department of Nursing and Allied  
Health, Winston-Salem State  
University



**Winston-Salem State University**  
WINSTON-SALEM, NORTH CAROLINA 27110

Office of the Vice Chancellor  
for Academic Affairs

Telephone 919 / 761-2160

April 20, 1988

Mrs. Sadie B. Webster  
208 Dellabrook Road  
Winston-Salem, North Carolina 27105

Dear Mrs. Webster:

Thank you for your letter of April 15, 1988 wherein you requested to use the records of graduates of the Winston-Salem State University's nursing program in order to conduct a study of the relationship of certain variables to the performance of our graduates' first attempt at the NCLEX-RN. You are hereby granted permission to review our records to collect the following data: preadmission cumulative GPA, SAT scores, reading level, general studies requirements completed, grades in nursing courses, NCLEX-RN scores. Permission is granted with the understanding that you will take the utmost care to protect the confidentiality of our students in your analysis.

Please advise if we may be of further assistance to you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard Bennett, Jr.".

Richard Bennett, Jr.  
Vice Chancellor for Academic Affairs

/es

cc: Chancellor Cleon F. Thompson, Jr.  
Dean Hazel Harvey  
Ms. Gwendolyn Hill  
Mr. Warren Oldham  
Dr. Haywood Wilson  
Dr. Alice Johnson

**APPENDIX C**  
**PERSONAL DATA PROFILE**

## PERSONAL DATA PROFILE

Code No

Age at Graduation

Ethnicity\_\_\_\_\_ Gender\_\_\_\_\_

Marital Status

Single

Married

Unknown

Educational Experience

Previous Degree(s)

Transfer Status

SAT Verbal

SAT Math

Preadmission GPA

Reading Level

General Studies Requirement

Completed

Course(S) deficit

NCLEX-RN Score

Nursing Course(s) repeated

Semester\_\_\_\_\_

APPENDIX D  
FOLLOW-UP LETTER



**Winston-Salem State University**  
WINSTON-SALEM, NORTH CAROLINA 27101

*Nursing Department*

June 29, 1988

Dear

Several weeks ago I mailed a survey form to elicit your response to Winston-Salem State University nursing program as part of the research for my dissertation. This letter is a special request for your reply to the survey.

I am enclosing another questionnaire in case you have misplaced the first copy. If you can take a few minutes from your busy schedule, your response will be most appreciative and helpful in assisting me to collect the data for my research. Please disregard this second request if you have mailed your survey.

Thanks again for your consideration to participate.

Sincerely,

*Sadie Webster*

Sadie Webster, UNC-G Doctoral Candidate and  
Chairperson, Department of Nursing and Allied Health  
Winston-Salem State University

APPENDIX E

COMPARISON AND/OR RELATIONSHIPS AMONG THREE  
GROUPS OF THE STUDY POPULATION



COMPARISON AND/OR RELATIONSHIPS AMONG THREE  
GROUPS OF THE STUDY POPULATION

---

I. Characteristics of the Groups

Group A - N = 28 graduates - NCLEX-RN Successful  
(1981-1984) Graduates

Group B - N = 34 graduates -  
(1984-1987)

Group B1 - N = 28 - NCLEX-RN Successful  
Graduates

Group B2 - N = 6 - NCLEX-RN Unsuccessful  
Graduates

II. Comparisons of Groups

A. Successful Graduates with Successful Graduates  
Group A - N = 28 Group B1 - N = 28  
(1981-1984) (1984-1987)

B. Successful Graduates with Unsuccessful Graduates  
Group A - N = 28 Group B2 - N = 6  
(1981-1984) (1984-1987)

C. Successful Graduates with Unsuccessful Graduates  
Group B1 - N = 28 Group B2 - N = 6  
(1984-1987) (1984-1987)

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